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Seeking a Wages Settlement

THE meeting due to be held today between Sir John Benstead, Deputy Chairman, with other representatives of the British Transport Commission, and those of the three railway trades unions may well be crucial. After wage negotiations lasting over seven months, the situation is reported to have crystallised as an offer by the Commission of pay increases estimated to cost an additional £6,000,000 in a full year, and rejected by the unions last week, with a counter proposal by the National Union of Railwaymen estimated by the Commission to cost an additional £18,000,000 a year, and by the N.U.R., £12,000,000. The Commission, it appears, had refused to go further than its offer, which would raise the present minimum by 2s. 6d. a week to £6 7s. Sooner, however, than shut the door on further negotiations, today's meeting was arranged in the hope of ending a deadlock. The N.U.R. proposals are said to have included, besides an increase in minimum rates, a considerable reduction in the number of grades. That union also criticised the Commission offer as favouring grades in which there is a manpower shortage, at the expense of other grades. The

Associated Society of Locomotive Engineers & Firemen objects to the Commission offer because it does not sufficiently recognise the skill and responsibilities of footplate staff. The Transport Salaried Staffs' Association considers inadequate the differentials offered by the Commission; this is largely the result of the high rates already in force for the lower grades. Nothing has been announced in the past few days about lodging turns, which remain an obstacle to any lasting wages settlement. A conciliatory attitude is adopted by Mr. J. S. Campbell, General Secretary of the N.U.R., in the *Railway Review*, the organ of his union. Difficulties in railway wage negotiations, he says, are not so much due to an unwillingness on the part of the management to meet the unions' claims as to the fact that obligations placed on the Commission by the Transport Acts of 1947 and 1953 have been a real obstacle to reaching a satisfactory conclusion. This statement contains more than an element of truth, in so far as it recognises the existence of statutory obligations, such as the necessity for nationalised transport undertakings to pay their way, though it is nonsense to imply that this obligation is unreasonable. Today's meeting at all events seems likely to start in an atmosphere both realistic and conciliatory.

Decline of Unemployment

THE shortages of certain categories of railwaymen in Britain cease to be a matter for surprise when viewed in the light of the latest Ministry of Labour employment statistics. The number of vacancies for workers now exceeds the number of unemployed. Against 353,651 vacancies in June last there were 220,100 unemployed. This is some 1 per cent of the total number in civil employment. When allowance is made for the proportion who are only technically unemployed, being in transit from job to job, it seems likely that this figure is incapable of much further reduction. The working population is 23,500,000, of whom 22,466,000 are in industry, commerce, and various services. Basic industries as a whole have attracted 49,000 more since June, 1953, and now employ some 4,018,000, but the mining industry has lost men and the number employed in transport and communications has fallen from 1,731,000 to 1,706,000. There is a continuing shortage of skilled men, and to fill 25,000 vacancies in skilled engineering, only 3,500 suitable workers are available. While so many vacancies exist in comparatively highly-paid industries, it is difficult to see how the lack of applicants, particularly among younger men, for employment in the railway industry can be remedied.

North British Locomotive—M.A.N. Agreement

THE North British Locomotive Co. Ltd. has announced that it has signed an agreement with the firm of Maschinenfabrik Augsburg-Nürnberg A.G., Augsburg, the designers and builders of the M.A.N. diesel engine. This will enable North British to manufacture diesel engines for rail traction and other purposes from approximately 100 b.h.p. to 2,000 b.h.p. The British company already manufactures its own hydraulic transmissions, and therefore will be able to offer its clients all over the world diesel-hydraulic locomotives completely manufactured in its own works in Glasgow. The development should go far to increase demands for diesel locomotives from railways overseas which require a highly efficient diesel engine and, at the same time, the skill and reliability of British workmanship. One of the disadvantages under which British locomotive manufacturers have been labouring is variation in their labour requirements, resulting in loss, at slack periods, of labour to other industries which may seem to offer more attractive employment; the new agreement should greatly help the North British Locomotive Co. Ltd. in this respect. It is also another welcome sign that British locomotive manufacturers are fully aware of the potentialities of the diesel traction market, and are able and willing to adapt themselves to the conditions necessary for effective competition in this sphere.

Manufacturers and Railway Freight Services

THE probability of improved railway freight services has been indicated by Sir Brian Robertson, Chairman of the British Transport Commission, at a meeting with Lord Rochdale, President of the National Union of Manufacturers, and his colleagues. The union had drawn attention to three general complaints of railway service which appeared in evidence collected from its branches. These were that transits were too long, that consignments were delivered in parts at different times, and that damage or loss in transit was excessive. Sir Brian Robertson said that the improvements would take time to produce results, but he was "reasonably optimistic" about the outcome. Last autumn the branches of the union began close liaison with local railway authorities and it was suggested at the meeting that this liaison should be developed to the fullest possible extent, including notification of the requirements of individual manufacturers. The Council of the N.U.M. decided to call for reports on the results of this closer co-operation in four months' time, and may then seek a further interview with the Commission. Such co-operation should greatly help both manufacturers and the railways and should lead eventually to a close mutual appreciation of their problems. The lead given by the National Union of Manufacturers might well be followed by those industries which have no such arrangements of their own.

Winter Passenger Services

A FEATURE of British Railways winter timetables, in force from September 20, is the large number of summer accelerations to be continued through the winter. There will be 47 trains making start-to-stop runs at 60 m.p.h. or more, compared with 46 in the present summer service and 27 last winter, and five additional non-stop runs of over 100 miles. The sleeping cars in the 12.5 a.m. from Paddington to Birkenhead, returning in the 7.15 p.m. from Birkenhead, will be a revival of a short-lived experiment of some years ago in providing sleeping accommodation on the G.W.R. Birmingham and the North main line. New accelerations are between Euston and Glasgow, with the "Mid-Day Scot" timings cut by 20 min. northbound and 45 min. southbound and reductions of 30 and 15 min. respectively in the winter schedules of the north and southbound "Royal Scot." The average of 565 trains with refreshment cars and 585 with reserved seats daily are increases over last winter. During the period of the winter timetable it is hoped to introduce some of the new lightweight diesel trains in Lincolnshire and West Cumberland and on the Watford Junction—St. Albans branch of the London Midland Region.

Coaching Stock Weights

ATTENTION is being directed once again to a steady increase in the weight of American coaching stock. When the first lightweight vehicles were introduced in the middle 1930s, by the use of steel and aluminium alloys, including stainless steel, the average weight of a chair coach was brought down to about 47½ tons, of a restaurant car to 53, and of a sleeping car to 56 tons; corresponding weights of the latest vehicles average 59, 64, and 66 tons respectively, while some of the latest 12-wheel full-length "dome" cars weigh all but 90 tons apiece. In comparing such figures with those of British stock, it must be remembered that the standard American coach length now is 85 ft., against the British 63 ft. 6 in., and that the American vehicle is more than a foot wider, but even so, the latter is disproportionately weighty. The increase is largely accounted for by air-conditioning plants, now weighing seven tons or more per vehicle, which in turn greatly increase the demand for electrical power. Full-length dome cars require a complete diesel-electric power plant of 19 tons weight to meet the air-conditioning demand, and this increased load has further added to the weight by making necessary six-wheel instead of four-wheel bogies. A 14-car train of modern streamline stock, such as the new Santa Fe "San Francisco Chief,"

weighs little short of 900 tons, a formidable proposition for high-speed haulage through the mountainous Western States.

Future of the Helicopter

THERE is widespread acceptance of the idea that the helicopter will eventually be used as a regular form of transport to and from the centres of the major towns and cities of Great Britain, where it would be a serious rival to the railway, and more particularly to first class passenger traffic, but the recent refusal of the Westminster City Council to grant planning permission for an international helicopter station at Charing Cross in the heart of London exemplifies the general cautious approach to helicopter problems. The Council is to await the results of experience at the South Bank site, and the need for experience and development of suitable aircraft has been stressed by Lord Douglas of Kirtleside, Chairman of British European Airways, who says that the "helicopter era" will not be a reality for a good many years. One function of helicopters is generally thought to be the transfer of passengers and baggage between city centres and airports, but it is significant that Belgium—in the forefront of helicopter development—is shortly to use an electrified branch of the National Railways for this traffic between Brussels and Brussels airport. It seems unlikely that any helicopter at present envisaged could be operated in this country at costs low enough to justify fares comparable with those of the railways.

The Melbourne Underground

STREET congestion is one of the main reasons advanced for building a four-track loop of the Victorian Railways under the heart of Melbourne, of which project some particulars are given elsewhere in this issue. The new line is expected also to relieve congestion at Flinders Street, the principal passenger station served by the electric suburban service. The provision of four tracks and the construction of the line at some depth below the surface, warranting escalators at one or two stations—though most of the work will be cut-and-cover—make the project an expensive one. The cost is estimated at £15,000,000 and the duration of construction, three to five years. Road traffic difficulties in the centre of large cities, besides the growth of population, have caused demands for and decisions to build underground lines in several cities since the war—after a lull of some years before 1939. Examples of new underground lines are to be found in Toronto and Tokyo, and a tube railway in Calcutta is under active consideration. The proposed line in Melbourne, however, is to be an integral part of the main-line railway system, and so more resembles the Brussels Junction Railway, though, unlike the latter, it is not, apparently, to cater for long-distance traffic.

Increasing Line Capacity in the U.S.A.

AN operating paradox has resulted in the U.S.A. from the partial removal of the southbound main line of the double track between Ludlow and Tateville on the Southern Railway System between Cincinnati and Chattanooga. The single line which remains, with alternating sections of double track signalled for double-direction working, has a line capacity greater than that of the former double track signalled for normal working. This result has been achieved by careful spacing of the double-track sections and the use of C.T.C. Of the 167 miles between Ludlow and Tateville 73.8 miles were converted to single track and 11.6 miles of sidings were removed. The sidings have become redundant as it is now found possible, by supervision from the central control office, to keep trains moving on the running lines. The turnouts have been designed to be taken at speeds up to 45 m.p.h., which entails little slackening of speed, and the provision of crossovers at two-and-a-half-mile intervals, as shown in the diagram accompanying the article in page 179 of this issue, has made the double track sections very flexible.

Disregard of Instructions

THE collision outside Victoria Station, Sheffield, on January 25, 1954, arose from a mistake made under some stress of working, after a failure of the block bell, but would have been prevented had the signalmen and a driver obeyed plainly worded regulations. As will be seen from our summary of Colonel D. McMullen's report in this issue, trains were being accepted by telephone messages in conjunction with the operation of the block instruments, and one had come to a stand at a home signal, where the driver failed to whistle in accordance with Rule 55. This is not an infrequent circumstance and we have never understood why drivers, if only for their own sakes, do not always take this elementary step to ensure they are not overlooked. The signalman in the rear asked where the train was and the man in advance assumed that it had gone forward and that he himself had omitted to give "train out of section" for it. Without looking outside, which would have shown him the train lights, he restored the block to normal and telephonically accepted a light engine, the driver of which had practically no chance of avoiding the collision. With emergency working still in force—although actually the block bells were in order again—trains should have been cautioned on entering the section and instructed to pass the signal concerned at danger, but these requirements were not being carried out at the time of the collision.

Electric Locomotive Performance in South Africa

THE latest stage in electrifying the Cape Western main line of the South African Railways has been the extension of electric working from De Doorns to Touws River. Severe gradients and curvature on this section had restricted traffic capacity with steam traction, and imposed on the new electric motive power the exacting requirements to which reference is made in our description of the North British-G.E.C. 3,030-h.p. locomotives on another page. The locomotives were required, for example, to make two starts within 20 min. against a 1 in 66 gradient with a trailing load of 1,200 tons. In practice the equipment showed no signs of being overtaxed when the starts were made well within the specified time, the temperature of the hottest section of resistance not exceeding 300° C. while the resistance compartment temperature did not rise above 100° C. Subsequent tests against 1 in 40 with loadings of 675 to 700 tons were equally satisfactory. Some of the locomotives have now run mileages of over 100,000, in the course of which the specified performance when motoring and regenerating has been achieved without adjustments being required, and there has been favourable comment on the smoothness of the transitions between the three motor groupings both in the motoring and regenerative connections.

Future of the London Transport Executive

THE re-appointment for a term of only one year from October 1 of the Chairman and Members of the London Transport Executive must give rise to considerable misgivings, apart from its injustice to the individuals concerned. The fact of their re-appointment was stated a few days ago by Mr. Alan Lennox-Boyd, then Minister of Transport & Civil Aviation, shortly before he relinquished that office to become Secretary of State for the Colonies.

In a written reply to a question put in the House of Commons he said that he had made these appointments on each of the last two occasions for one year only, "for the reason that the changes contemplated in the structure and organisation of the British Transport Commission made it advisable for him to do so." He regretted the necessity, as Sir John Elliot, Chairman of the London Transport Executive, and his colleagues, had the complete confidence of the Minister and of the Chairman of the Commission, Sir Brian Robertson. "Until the major changes in the structure and organisation of the British Transport Commission have been put into effect," he added, "I am

still unable to make these appointments for a longer term."

What the changes referred to are, is not clear. The Transport Act of 1953 provided for abolition of all the Executives of nationalised transport except for the London Transport Executive. The reorganisation of the railways, for which the Act provides, virtually excludes London Transport railways, as the reorganisation scheme "need not deal with all or any of the railways, the operation of which forms part of the passenger transport services provided at the passing of this Act by the London Transport Executive;" nor is London Transport included in the proposals for reorganisation of British Railways made in the recent White Paper. Whatever changes may be made in the duties of individual Members of the Commission as a result of the implementation of the White Paper proposals, such as service on the proposed railway area boards, it is hard to see why the present relationship between the Commission and the London Transport Executive should be altered. Contact between the Commission, British Railways, and London Transport in the matter of fares and, wages, and other matters of common interest already is provided for.

Mr. Lennox-Boyd's reference in his reply to major changes in the structure and organisation of the Commission is disquieting. Does the Government contemplate further interference with the nationalised transport undertakings? After the disposal of a large part of its road haulage assets and a major change in the management of the main-line railways, both of which are having a disturbing effect, not least on the morale of the staff concerned, and, therefore, on efficiency, one would have thought that nationalised transport could be left alone to function without further interference. It is strange that major changes are envisaged now, if they were not included in the Act of 1953. This seems to imply that another bite may be taken at the transport cherry.

Another factor which may be thought to bear on the tenure of office of the Chairman and Members of the London Transport Executive is the committee under the chairmanship of Mr. S. P. Chambers, which was appointed by the Minister in the summer of 1953 "to inquire into the conduct of the undertaking carried on by the London Transport Executive (excluding any question relating to charges) with a view to ascertaining what practical measures can be taken by the British Transport Commission and the Executive in order to secure greater efficiency and economy, and to report." The findings of the Committee are expected towards the end of this year. From its remit it seems clear that the existence and conditions of service of the London Transport Executive are not included, and there have been official disclaimers to that effect. Nevertheless the refusal to re-appoint the Executive for more than one year, particularly in view of the impending report of the Chambers Committee, may be thought to depend on its findings. The committee, however, is not sitting in judgment on the Executive, whose efficiency is not in its purview. Mr. Lennox-Boyd's statement in the House might have made this quite clear.

This being so, the treatment of the Chairman and Members of the London Transport Executive is very unfair. Most of them are whole-time professional managers of a vast undertaking, and their responsibilities are immense. Even if they were all simply part-time advisers it would be unjust not to give them a greater degree of permanency of employment. No commercial undertaking would expect its top executives to work efficiently and happily on these terms, and the resultant feeling of insecurity must affect subordinate staff.

The statement in the House that the Executive enjoyed the confidence of Mr. Lennox-Boyd—as doubtless it will enjoy that of his successor, Mr. John Boyd-Carpenter—and that of Sir Brian Robertson, may have been thought a palliative, but a more definite and concrete statement as to its future is needed. The sooner the present Minister of Transport & Civil Aviation makes it clear what the Government intends to do with London Transport, and with those who manage it, the better for the millions of people vitally affected by its efficiency.

Operating Results for 24 Weeks of 1954

THE index of industrial production, which is based on 100 for the year 1948, is estimated at 127 for the month of June, compared with the final figure of 118 for June, 1953. The growth in output has been uneven recently, but an average eight or nine points rise was maintained during the first six months of the year. Our nationalised railways consequently operated in favourable economic conditions and yet Number 6 of *Transport Statistics* shows a marked recession in freight train traffic over the 24 weeks to June 20.

British Railways then originated 133,999,000 tons, a decrease of 634,000 from 1953, or 0.5 per cent. Merchandise forwardings were down 373,000 tons and minerals 516,000 tons, but 203,000 more tons of coal and coke were carried. The average haul for all traffic was about a mile less this year, so that 168,776,000 fewer ton-miles were worked, a decrease of 1.6 per cent. Wagon loadings were 88,000 below 1953 (0.5 per cent), 19,000 fewer wagons carrying merchandise and 69,000 fewer carrying mineral traffic.

Wagon miles declined by 30,657,000 (1.5 per cent), but the average wagon load at starting point was a record at 8.96 tons during the 12 weeks to June 20. In the 24 weeks to June 20 the London Midland used 19,000 more wagons (one per cent) to carry 38,000 fewer tons of merchandise and livestock, with a concomitant reduction of 32,799,000 ton-miles, or 3.1 per cent.

With a diminishing volume of traffic, it is odd that during the 24 weeks to June 20 freight train miles were up 427,000 (0.7 per cent). Train engine-hours in traffic were cut by 4,000, but the output of train operation, as measured by net ton-miles per train engine-hour, dropped to 1,090 in the 12 weeks to March 28 (1.4 per cent) and to 1,167 in the 12 weeks to June 20 (1.8 per cent). In the second period productivity fell in all Regions except the Eastern and North Eastern, which raised their output of net ton-miles in a train-hour to 1,324 and 1,532 respectively. At the same time these Regions raised their train loads while the all-line average load was four tons lower. In both 12-week periods overall freight train speed was slightly faster, despite slower movement in the Western Region. An advance of a tenth-of-a-mile in the Eastern Region freight train-miles per train engine-hour to 9.18 m.p.h. was a noteworthy feature of the second period.

A statement of the rolling stock position at June 20 shows British Railways as owning 18,834 locomotives. The number under repair was 3,100 or 16.5 per cent of ownership. The stock of freight vehicles was 1,122,587, but 82,595, or 7.3 per cent, were under repair. The available operating stock was thus 1,040,000, some 3,940 more than the number of serviceable vehicles in June, 1953.

RAILWAY PASSENGER TRAFFIC

In the five months to May 31 British Railways originated 391,002,000 passenger journeys, 247,000 (0.1 per cent) more than a year ago. About 40 per cent of these journeys began in the Southern Region, which had 1,236,000 more passengers (0.8 per cent). The Eastern Region increased its travel volume at the same rate by starting 545,000 more journeys, while the London Midland lost 1,005,000 passengers (1.2 per cent) and the Western 465,000 (1.1 per cent). First class journeys for the whole system totalled 8,150,000, or 70,000 below the 1953 bookings; this small decrease of 0.8 per cent compares with large losses in higher class travel of 6.7 per cent in the year 1953 and 12.3 per cent the previous year.

LONDON TRANSPORT

In the 24 weeks to June 20 London Transport carried 262,613,000 people by rail, a decrease of 10,381,000 (3.8 per cent), and 1,650,059,000 by road, a decrease of 33,940,000 (2 per cent). On an average, London Transport lost passengers at the rate of 1,846,700 a week, but was able to reduce car-miles by 2,895,000 (one per cent). Road Passenger Transport (Provincial and Scottish) was more fortunate, carrying 1,065,627,000 people. That represented an increase

of 14,406,000 on 1953 (1.4 per cent) and entailed the running of 3,406,000 more car-miles, also an increase of 1.4 per cent.

INLAND WATERWAYS

The tonnage originating on Inland Waterways in 24 weeks was 5,845,000 tons, an increase of 28,000 tons (0.5 per cent). Coal class traffic decreased by 166,000 tons (5.2 per cent), while bulk liquids increased by 35,000 tons (3.9 per cent) and general merchandise by 159,000 (9.2 per cent). The make-up of the traffic differed widely from last year's carryings and passed over shorter lengths of canal. The ton-mileage of 94,142,000 was 4,417,000 below 1953 (4.5 per cent).

Aggregates for Docks, Harbours and Wharves, which were included in the 1953 series of *Transport Statistics*, are omitted from this year's series. These statistics are more important than the figures for Inland Waterways and it is desirable that they be published at least twice a year.

Making Use of the Technical Press

NOBODY in a responsible position, whether technical or managerial, on a railway or associated industry can afford not to keep himself informed of current developments. These are likely to be mainly improved techniques and scientific discovery, and any new devices, plant, machinery and other products and new materials and services available. It is generally agreed that perusal of technical journals is one of the best ways of keeping up-to-date, and a great many individuals cause to be sent to them copies of technical publications, either for their exclusive reading or to be shared with their colleagues.

The demands made today on the time of, say, a district railway engineer or a manager of a locomotive works, the many technical journals which deal with the subjects which concern him, the large amount of material which needs to be studied, and the desirability of recording and classifying the information obtained, make difficult the efficient use of this material. The problem is discussed in the June issue of our American contemporary *Machine Design*. For purposes of illustration the article describes the use of technical journals in an information service carried on for several years in a medium-size manufacturing plant in the U.S.A.

Before the service was started a survey was made of the many periodicals supplied to, or desired by, all those in the organisation. It was decided as a result to institute a "circulation service," and at the same time to weed out certain journals, which resulted in reduction of their number from 45 to 15. It was felt that at least three persons—in this case engineers—should show interest in a journal to warrant its inclusion in the circulation service; and that for proper use, no single copy should be routed regularly to more than six engineers. In practice no copy of a monthly was routed to more than five persons. Only five men were expected to deal with one copy of one issue in one month, an average of six days each. On this basis one busy man could not be expected to peruse a reasonably informative weekly technical publication in the course of rather more than one day; one copy of such a weekly would be required for each reader on the staff.

Routing slips provided for marking of pages of interest and for names of additional readers, and also for the eventual return of an issue to a reader unable to deal with it in his turn who passed it on to the next reader on the list. The article describes in some detail the method adopted of filing back issues. One way suggested of building up a subject index is to preserve in a binder the index pages of individual issues. Reference is made to the desirability of master data file or index of all technical material contained in the periodicals, but no other details are given. What chiefly emerges is the economy and the increased efficiency in gaining information to be derived from a rationalised circulation system for technical publications, and the necessity for sufficient copies of issues, at least of the more relevant and informative journals, so as to ensure adequate time for perusal.

South Australian Railways

THE report for the year ended June 30, 1953, of the South Australian Railways Commissioner, Mr. J. A. Fargher, covers railway affairs during the last year of the late Mr. R. H. Chapman's administration. Working results showed an improvement of £904,748 after taking into account the reduction from £4,250,000 to £4,050,000 of the State Government contribution. Increased rates and fares which came into effect on January 1 and July 1, 1952, produced some £2,150,000 of additional revenue compared with the previous year, which more than offset increases in wage rates, cost of materials, and so on, which amounted to £1,807,000 during the year. The non-recurrence of expenditure for deferred maintenance on the South-Eastern narrow gauge system, £374,361 in the previous year, also affected the position, and the year closed with a net surplus of £560,407, compared with a net deficit of £144,341 for the previous year.

Some of the principal results for 1951-52 and 1952-53 were:—

	1951-52	1952-53
	(thousands)	(thousands)
Total train-mileage	6,944	7,199
Passenger journeys	18,269	17,565
Goods gross tonnage	4,376	4,568
	£	£
	(thousands)	(thousands)
Coaching receipts	1,656	1,786
Goods receipts	7,102	9,276
Total receipts	9,511	11,948
Total working expenses	13,305	14,775

Although the increase in railway revenue more than offset increased costs during the year, additional revenue from all increases in rates and fares since 1938, estimated to amount to some £4,560,000 for 1952-53, falls short of meeting increased costs of wages and materials over the same period, which now are £9,752,000 a year. Improvements in efficiency saved some £350,000 during the year, but until railway charges are brought more into line with costs, reliance on heavy Treasury subsidies is stated to be inevitable.

Freight and livestock traffic continued to increase, although not as much as in the previous year. Average earnings per ton-mile, largely as a result of the rate increases on July 1, 1952, have risen by 96 per cent since 1946. Over the same period the average hourly wage rate paid to staff has increased by 174 per cent, and the disparity remains unsatisfactory.

Movement of concentrates from Broken Hill increased from 520,000 tons to 623,000, but Leigh Creek coal traffic fell slightly from 405,000 tons to 397,000. Movement of grain increased from 925,000 tons to 990,000, and the number of animals carried rose from 3,350,000 to 3,861,000. The car load system of contracting with transport agents was extended and 25,000 tons were carried on this system in the first year of operation. The system has been extended to operate between Adelaide and Sydney, via Melbourne, and is complementary to the container services via Broken Hill. Passenger revenue increased from £1,283,707 to £1,363,465. This is accounted for by the increased fares introduced, as passenger journeys fell, no doubt as a result of the growing use of private motor-cars.

Ample supplies of New South Wales coal were available, but industrial disturbances on the coal-fields made it necessary to call on reserves during the last two months of the year. The quality of coal received was most unsatisfactory, and until reasonably-priced coal of good quality from New South Wales is available, the use of oil fuel will continue to be considered. Use of oil fuel in steam locomotives fell from 76,000 tons in 1952 to 59,455 tons. Twenty-four broad-gauge locomotives were re-converted from oil to coal during the year, and later converted back to oil again as coal reserves were depleted.

During the year, six more of the 1,760 h.p. main line diesel-electric locomotives, with motive power equipment supplied by the English Electric Co. Ltd., were brought into service, so that nine of the ten ordered were in operation on June 30. The remaining unit was completed early in July and they are giving excellent service. A further

six 5-ft. 3-in. gauge MacArthur locomotives were purchased from the Commonwealth Government, and nine were in operation at the end of the year. The first of the ten 3-ft. 6-in. gauge locomotives on order from Beyer, Peacock & Co. Ltd., was placed in service in June. Two second class joint stock air-conditioned sitting-up coaches for use on the Adelaide-Melbourne "Overland" express were completed, and progress was made with the construction of 14 new type railcars and 11 passenger trailer cars, all of 5-ft. 3-in. gauge. Three existing railcars were fitted with diesel engines. At the Islington Workshops 141 broad gauge and three narrow gauge freight vehicles were constructed, and nine broad-gauge and 106 3-ft. 6-in. gauge vehicles were supplied under contract. In addition, 490 broad-gauge freight vehicles were under construction at the end of the year, either at Islington or by Australian contractors, and tenders for ten 750-h.p. diesel-electric locomotives of 5-ft. 3-in. gauge were issued.

U.S.A. Railway Labour Problems

SINCE the war relations between the U.S.A. railways and some of the trade unions representing their employees have been anything but happy. In 1946, some 15 stoppages of railway work involved 356,000 persons and the loss of 912,000 man-days. In 1949 the number of stoppages was 10 and 49,700 men were idle for a total time of 1,180,000 days. More recently the President intervened in several disputes, when strikes occurred or were threatened, usually by setting up an Emergency Board to examine the facts and propose terms of settlement. It almost became common form for the awards of these boards to be accepted by the railways, only to be rejected by the unions, and the President finally seized certain lines to safeguard public interests.

At one time the Railway Labor Act of 1926 (amended in 1934) was thought to provide a model policy for settling disputes; but of late years its machinery has failed to avoid trouble. Mr. Jacob J. Kaufman is one of many students of transport economics who have participated in hearings before emergency and arbitration boards established in accordance with the provisions of the Act. In the light of these experiences, he has reviewed the history of collective bargaining in the railway industry in his book, "Collective Bargaining in the Railroad Industry," the subject of a brief notice on another page. He concludes that, as a method of adjusting wages, it has virtually collapsed. He considers that the earning status of railway workers has deteriorated from 1936 onwards in comparison with the remuneration of manufacturing workers, but statistics he quotes are of too general a nature to support the conclusion that the operating grades, engaged in train movement and consequently "key" workers, have ceased to be "the aristocrats of labour."

The book entitled "Railroad Wages and Labor Relations," written by Mr. Harry E. Jones and discussed in an editorial article in our February 26 issue, gave separate figures over 30 years to 1953 for each grade. The wages paid were high, though restricted in some cases by the unions' practice of limiting the amount of service performed in a month. Last year the average straight time rate of pay for all employees rose by 2.5 per cent above 1952 to \$1.89 per hour and average hourly earnings advanced to \$1.99. These may be peak payments as the recession in traffic, which marked the last four months of 1953, persists in 1954. To the end of May total operating revenues were down fully 13 per cent and net railway operating income was 41.5 per cent less, while the average number of employees was 156,000 lower than in May, 1953, a decrease of 12.7 per cent.

These changes in the U.S.A. railway position may put an end to labour troubles, for the time being at least; and they may avoid modifications which Mr. Kaufman would like to make in the Railway Labor Act, with the object of restoring genuine collective bargaining and eliminating difficulties about working rules as a major source of conflict.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

U.S.A. Train Accelerations

August 9

SIR,—An article in your August 6 issue reported the speeding up of a dozen well-known U.S.A. express trains. The odd point about American trains is that the faster they run, the fewer people they carry. Comparing 1948 with 1953, the average passenger train speed rose from 36·7 m.p.h. to 39·1, while the number of passengers per train decreased from 101 to 95. Passenger-miles declined by 23 per cent and produced 12·6 less revenue in spite of certain increases in fares. In the five months to May this year, passenger revenue declined by nearly \$39 million, or 11·3 per cent, and the loss was not made good from freight revenue, which dropped by \$535·5 million, or 14·4 per cent.

All the railways mentioned in your article had a setback. At May 31, the Chicago & North Western showed a deficit and the New York Central escaped one by the narrow margin of \$238,000. By making a cut of 15 per cent in operating expenses, the Pennsylvania saved a third of its 1953 net operating income, despite a 21 per cent fall in freight revenue. The Central Western railways had decreases in passenger revenue varying from 8 per cent on the Burlington to 18 per cent on the Santa Fé, with losses of freight revenue in much the same proportions.

As things stand, train accelerations may provide advertising material, but can hardly benefit anybody except the suppliers of diesel and lubricating oils.

Yours faithfully,

R. BELL

Frogmal, N.W.3

Anglo-Continental Traffic

August 13

SIR,—I refer to the admirable letter from "Montcler" in your issue of August 6. We are always told that there is no demand for through services between stations in the provinces and the Channel ports; yet the organisers of motorcoach tours fill their vehicles at Sheffield, Edinburgh, and so on, and, taking their passengers direct to the ports or airports, take traffic away from British Railways. Nothing discourages the passenger so much as the prospect

of having to cross London, especially with baggage, as no through baggage registration exists. The airlines will register one's baggage from Shetland to Cairo, if asked, and see that it is taken quickly from one airport to another in London if arrival and departure from the same airport cannot be arranged. With passengers from Ireland or the U.S.A. in transit through the U.K., baggage is carried under customs seal, as the railways do across Europe, but not across Great Britain.

British Railways are losing their international traffic to the Continent, but not to Ireland, because the Anglo-Irish services are well integrated with the local services and connections, and through coaches are provided all over England. With the Anglo-Continental services no connections and no through coaches are provided, even though a good many inter-Regional services go quite near to the ports concerned. For instance, the Birkenhead-Dover train avoids Dover Marine Station, and the various trains between the North and West and Southampton avoid all connection with the Havre and St. Malo services.

At last year's Edinburgh International Festival, nearly 40 per cent of the total arrivals were by air, special through air services being operated for the purpose. No through coaches from or to Harwich, via York, were provided; these would have provided excellent connections from nearly all over Europe via the Hook of Holland. It is also a great pity that British Railways must be the one main-line railway system in Europe to start its summer timetable at a different time to the rest.

Yours faithfully,

G. H. HAFTER

107, Mortlake Road,
Kew, Surrey

[The situation of the Channel ports in relation to population centres is quite different from that of the Anglo-Irish packet ports. Most travellers from and to the Continent either stay in London or seem not to object to passing through it; and it is doubtful whether the number of through-booked passengers would justify through coaches between ports in S.E. England and provincial destinations. The proportion of Anglo-Continental to total passenger traffic on British Railways would not justify assimilation of dates for the duration of the summer and winter passenger services.—ED. R.G.]

Publications Received

Electric Traction. By A. T. Dover. London: Sir Isaac Pitman & Sons Limited. 9½ in. × 6½ in. 441 pp. Illustrated. Price 60s.—When it is recalled that the second edition of this standard work on electric traction appeared in 1929, it is easy to appreciate the extensive field the author has had to cover in producing a third edition worthy of the reputation his book enjoys among engineers and students. He has brought his subject matter and illustrations up-to-date on a scale which has imposed brevity on him in some of his descriptions of typical equipment, but there are many references to papers and publications dealing with these subjects in more detail. Such recent developments as the Bas Congo-Katanga 50-cycle locomotives in the Belgian Congo, the latest Pennsylvania Railroad 25-cycle heavy freight locomotives, and the Brown Boveri and Alstom flexible transmission systems now find their place in the book. The chapters on overhead equip-

ment and substation apparatus have been revised similarly. In combining these surveys of practice with the sections on the mechanics of train movement, train resistance, and the calculation of speed-time curves which have made "Dover" an accepted source of reference since its first appearance, the author has rendered a service both to advanced students of his subject and to all who need a comprehensive survey of modern trends.

Collective Bargaining in the Railroad Industry. By Jacob J. Kaufman. New York: Columbia University Press. (London: Geoffrey Cumberlege, Amen House, Warwick Square, E.C.4.) 8½ in. × 5½ in. 235 pp. Price 30s.—This book, the subject of an editorial article on page 173, is divided into four parts. The background to the problem is outlined in Part I, in four chapters. Part II deals with the Railway Labor Act in operation. A single chapter, forming Part III, discusses the right of railway workers to strike. In Part IV the

author summarises the matter and makes recommendations. The book is copiously documented, with a bibliography.

Power Transformers.—Constructional details of power transformers of capacities from 2,000 to 45,000 kVA. are described and illustrated in a new publication, No. 51103, from the Brush Electrical Engineering Co. Ltd., Loughborough. Attention is drawn to several features characteristic of this range of equipment, such as the method of ensuring adequate access of cooling oil into the core by building longitudinal and transverse ducts into the structure. Some of the illustrations show how mechanical strength has been studied as closely in the design of these units as their electrical features. Provision has been made in the design for tapplings to be taken to studs on an insulated board, to a hand-operated off-load tap-changer, or to an on-load tap-changing switch with local, remote or automatic control.

THE SCRAP HEAP

Bargain Travel

The excursion fare from Inverness to Glasgow, on the Inverness holiday on July 22, 1904, was 4s. 6d., according to a contemporary account in the *Inverness Courier* which has been sent us by a correspondent. He points out that the distance from Inverness to Glasgow and back is 362½ miles, which works out at 0.149d. a mile. Two railway companies were concerned: the Highland, 236 miles, and the Caledonian, 126½. About 1,000 persons travelled to Glasgow by the excursion that day, and a total of 4,734 passengers is reported to have left Inverness by Highland Railway trains—a remarkable figure in view of the population of Inverness and of economic conditions in 1904. Our correspondent adds that the excursion fare to Glasgow was 5s. almost up to 1914.

Historic Model of the "Rocket"

A model of the *Rocket* which has recently come into the possession of Babcock & Wilcox Limited, has unusual historic associations. Unlike most of the models which have been made of this locomotive, it is an actual contemporary, and was built less than 10 years after its prototype was still in steam.

According to available records, the model was one of two built by a workman in the works of Robert Stephenson & Company after the death of George Stephenson in 1848, to commemorate one of his most outstanding achievements. One model, it is said,

was presented to Robert Stephenson, son of George, and of this there is no trace. The other model was presented to George Robert Stephenson, nephew of George and a director of the firm, and descended through his son, Thomas St. Lawrence Stephenson, and then to a son of his wife by a previous marriage, Mr. William Alexander Mitchell. It has now been acquired by Babcock & Wilcox Limited on account of its association with the pioneer days of steam, and will join the collection of models in the firm's private exhibition hall and cinema in Salisbury Square House, London.

The scale of the model, which is illustrated on this page, is approximately $\frac{1}{15}$ full size, the gauge being just under 4 in. and the length 15 in. between buffer beam and rear of footplate, with an overall height of 12 in. to the chimney top. It stands on a miniature track under a glass dome 20 in. high. Made principally of brass, with a copper boiler, it appears to be complete in detail, and is obviously intended to steam.

Vandalism

I travelled down to Avoca the other day in one of the new C.I.E. rail coaches. . . . I was most favourably impressed by the waxed oak woodwork, the tweed curtains on the windows, the separate reading lights and comfortable upholstery.

The toilet compartment was finished in pale green tiled hardboard; and was

clean, modern, and a very far cry from the dark and dirty dungeons we had to use on Irish railways in the old days. Or it could have been. It made me sad to see that, although this coach had obviously not been in use for more than a few weeks, there were names scratched all over the frosted glass of the window, the panelling was deeply scored and scratched, and the entire contents of the paper towel dispenser lay on the floor, unused, in a sodden heap.—"Pro-Quidnunc" in *The Irish Times*."

Averting Sacrilege

A section of the cobbled platform from which George Stephenson first stepped aboard *Locomotion*, No. 1, of the Stockton & Darlington Railway is still in place in the station yard of the Durham village of Heighington. One day a ganger—apparently with no mind for history—thought the platform should be levelled and brought up to modern requirements. He was about to translate his thought into deed when the District Engineer heard of it. He seized his hat, and a hatchet, and swooped down on Heighington. On arrival he immediately opened hostilities and threatened to make short work (with his hatchet) of anyone—including the local ganger—who was crack-headed enough to attempt to obliterate the historic platform. The cobbled platform is still there.—From *The Manchester Guardian*."

To A.C.P.

(See our issue of July 30, 1954)

Welcome, sweet prophet of modernity,
To this high-principled fraternity!
I wonder what possessed you with the
notion
That I am crazy about locomotion
As chronicled by the historian
And smugly labelled "late Victorian"!

By all means let our Continental friends
Frantically follow their exotic trends
And fly what flag they like, and go as
fast
As their exuberance bids; I'd be the last
To hamstring progress or to denigrate
Improvements instigated by the State.

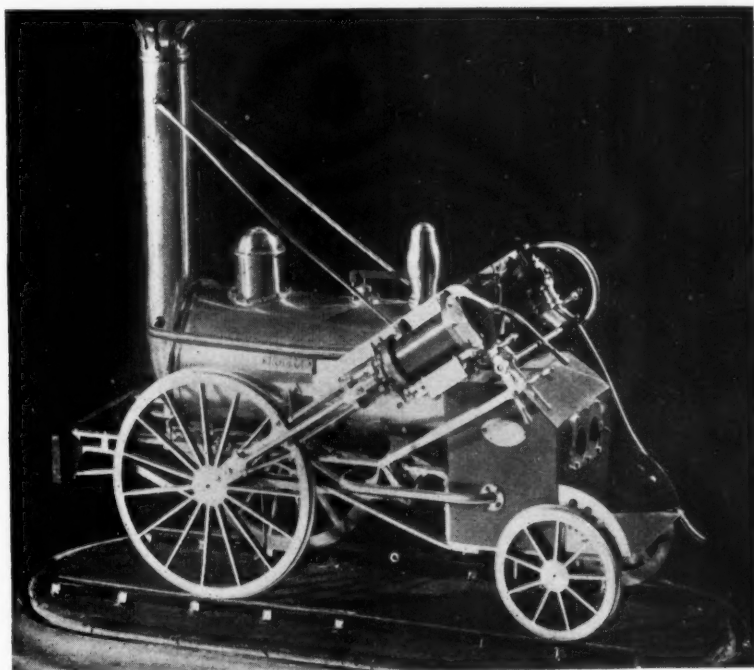
One could expatiate a lot, no doubt,
On points of difference and rave about
The "deadening hand" of age, or, conversely,
Dilate on youth's impetuosity,
Taking such chances as the gods afford
For argument; at least we'd not be
bored.

But I don't claim perfection for the old,
(Who, after all, presumes to gild the
gold?)

Nor, frankly, can I simulate the zest
Of those who clamour: "What is new
is best!"

I, merely, like most brother railway-
men,
Would like the good old colours back
again.

A. B.



Scale model of the "Rocket" built in the works of Robert Stephenson & Company after the death of George Stephenson, in 1848, and now in the possession of Babcock & Wilcox Limited

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

NEW ZEALAND

Murupara Line Progress

On the Murupara line between Kawerau and Kaingaroa Forest nearly 32 miles of track have been laid in three months, bringing the railhead to within a few miles of Murupara, the eventual inland terminus.

Over the line when it is completed 1,000-ton log trains hauled by three diesel-electric locomotives will run at up to 40 m.p.h. There will be mechanised loading facilities and the station yards will be designed to allow an uninterrupted flow of logs from forest to mill. The rail outlet from the mill will also be of extreme importance, as along it will flow newsprint, pulp and great quantities of sawn timber for export.

SOUTH AUSTRALIA

Goolwa Line Centenary Celebrated

The Goolwa-Port Elliot line was opened on May 18, 1854, with horse traction and was the first public railway in Australia. Its centenary was celebrated at Goolwa at a function attended by Messrs. J. A. Fargher, Railways Commissioner; C. H. Fidock, Secretary; A. A. Pryce, Chief Mechanical Engineer; and F. B. Harvey, General Traffic Manager. A special train of old stock and hauled by a locomotive built in 1894 ran over the route from Strathalbyn to Goolwa and Victor Harbour. From May 17-21 an exhibition of models, photographs and relics featuring a century of South Australian railways was held in Adelaide.

VICTORIA

Abolition of Busy Level Crossings

A committee was appointed some months ago to report to the Government on the abolition of level crossings. Victoria has 3,847 level crossings, 262

of which have gates and 85 are equipped with flashing lights or wig-wag signals.

There are five particularly busy crossings in the Melbourne suburbs, at Clifton Hill, Footscray, Moorabbin, Newport and Elsternwick. It has been suggested that these should be among the first to be abolished. The committee will report on the order in which level crossings should be abolished, the nature of each work and the cost. Last year 210 gates or fences near them were damaged by motorists. In May last nearly one a day was damaged.

The Victorian Railways attitude is that when funds are available they will be prepared to contribute the capitalised value of any saving that would be made by replacing the gates. Where there are gate keepers, the capitalised value of their wage would be contributed. Recommendations have been made to successive Governments that a fund be created to abolish level crossings and that legislation be introduced determining costs on an equitable basis.

NEW SOUTH WALES

Power-Worked Suburban Coach Doors

The Minister of Transport has asked the Commissioner for Railways for a report on the cost of equipping suburban electric trains with power-worked doors in view of a number of fatal accidents caused by passengers falling through open doors.

INDIA

Collision on Bombay Suburban Line

At 5.28 a.m. on June 4 a Central Railway suburban electric train travelling on the down Harbour Branch line, Bombay, collided with the rear of a shunting goods train which had just left Carnac Bridge Goods Depot, Western Railway. The accident occurred just north of Kings

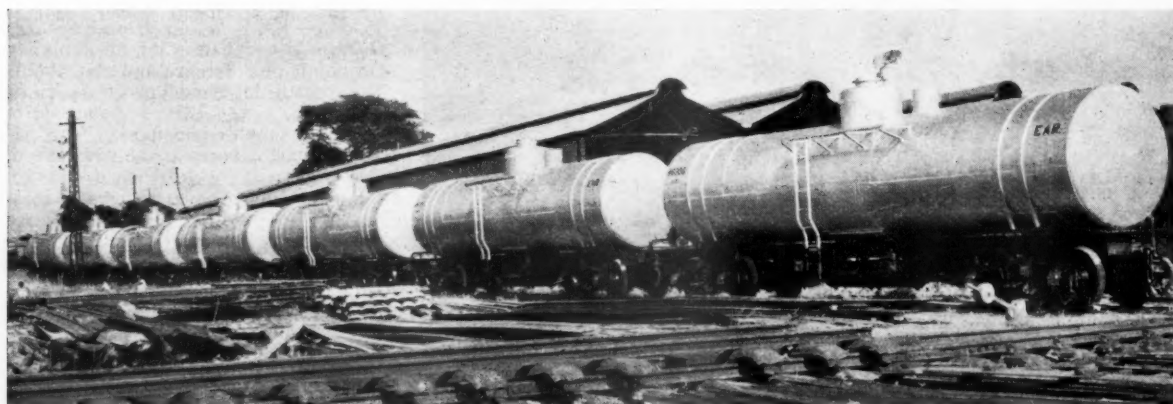
Circle Station. The front coach of the electric train was badly damaged, left the track and laid on its side across the up line and partly hanging over a drop of some 20 ft. where another line of the Central Railway passes under the Harbour branch tracks. The wagons were loaded with oil, and that in the damaged wagons exploded. The undamaged wagons were uncoupled and moved to safety with difficulty, as the explosions continued for about two hours. A wagon of aviation spirit was safely removed. The fire was extinguished after about five hours. The Western Railway guard and the Central Railway motorman were burnt to death and four passengers were injured. The permanent way and overhead equipment was badly damaged.

The down goods train had been held at a signal giving access to the Mahim loop of the Western Railway which kept the Kings Circle down starter at danger. The line is signalled with multi-aspect colour light signals and continuous track circuits. It is believed that the guard of the following electric train rang the motorman's starting bell without noticing that the signal was at danger and that the motorman started his train on hearing the bell and without noticing the signal.

EAST AFRICA

Oil Tank Wagons from South Africa

An essential part of the programme of conversion of locomotives to oil fuel on the Tanganyika Central line is the increase of the existing fleet of tank wagons to maintain a regular and sustained distribution of fuel oil to all locomotive depots. Dorman Long (South Africa) Limited received an order for 23 bogie tank wagons. For economical reasons and to conserve storage capacity, the wagons were shipped from South Africa broken down, in that the wheels and axles, bogie frames, brake components, main frames, couplings, bolts and rivets, tank plates, manholes,



Completed tank wagons manufactured by Dorman Long (South Africa) Limited, ready for traffic after erection in the Dar es Salaam workshops of East African Railways & Harbours

outlet valves, and electrodes for welding, were all independently consigned.

The vehicles were assembled and erected in the railway workshops at Dar es Salaam. All have been completed without interruption to the normal output of the workshops, reflecting credit on the six African and one Asian artisans engaged on the task.

The conversion to oil fuel on the Central Line, which it is hoped to complete by the end of this year, will mark the final stage in the conversion of the whole of the E.A.R. system, a work that will have taken seven years to carry through.

CANADA

Stations Named on Lynn Lake Line

The Canadian National Railways recently announced the naming of 12 stations on the Sherridon—Lynn Lake line in Northern Manitoba, which was completed and has been in operation since last November. The new C.N.R. subdivision which has yet to be named, runs 188.2 miles from Cranberry Portage to Lynn Lake.

The names include Charles, in honour of Flight Sergeant J. H. Charles, R.C.A.F., killed in action during the last war; he was the son of Major J. L. Charles, Chief Engineer of the C.N.R. Western Region, who was in charge of construction of the line.

Rafter, was named after the late Thomas Rafter, who had a long and outstanding career on bridge construction throughout Western Canada and for many years was on the Hudson Bay Railway in northern Manitoba; and Heaman, after J. A. Heaman, formerly Chief Engineer of the Grand Trunk Pacific, who retired as Assistant Chief Engineer of the Canadian National Railways.

UNITED STATES

New Hamlet Marshalling Yards

Work is well advanced on the large marshalling yard which is being built by the Seaboard Air Line Railroad at Hamlet, North Carolina, an important junction of three other routes with the principal Seaboard main line about 370 miles south of Washington. At the north end there will be a flat receiving yard for incoming trains, with nine tracks each capable of holding 135-160 bogie wagons. At the south end there will be a departure yard of ten tracks with a capacity of 110-150 wagons each. Between these will be the hump classification yard, with 58 tracks of 14-60 wagons capacity apiece.

Additional to the foregoing there will be tracks for cabooses, wagons carrying cattle and explosives, wagon cleaning, and light repairs, and two 70-wagon "trimmer" tracks at the exit end for adjusting train-loads before departure. The hump will be 20 ft. high, with a 1 in 33 descending gradient levelling off

to 1 in 650 in the classification tracks. Of the 240 switches, 58 will be operated by electro-pneumatic switch machines.

An electronic scale will weigh every car immediately it passes over the hump and electronic apparatus will then control the working of the 109-ft. master retarder, and the three intermediate and seven final retarders. Two-way loudspeaker communication and every other possible assistance to the working will be provided. The yard is expected to come into full operation early in 1955, and will have cost a total of \$8,500,000.

Third Class Sleeping Berths

Hitherto the most comfortable night accommodation for "coach" or third class passengers on American railways has been in reclining chair cars. Although the latest, with horizontally-tilting chairs and leg-rests, are most comfortable, they lack privacy and all their passengers must use communal toilet facilities.

Early this year the Budd Company produced a mock-up of a "siesta coach" similar to the "duplex roomette" sleeping cars, though with more restricted space. In an 85-ft. coach it would be possible to include 40 of these tiny bedrooms, each with its own toilet facilities, and thus offer coach passengers facilities comparable with those of the latest third class sleeping cars in Great Britain.

This mock-up was exhibited recently by the New York Central System at Grand Central Station, New York, to obtain the reaction of long-distance travellers. This was overwhelmingly favourable, in the ratio of 226 to 1 of those who filled in a simple questionnaire on the subject. Half the passengers interviewed expressed themselves willing to pay a supplement of \$5 over the coach ticket rate for the use of such accommodation.

FRANCE

Easing Movement of Points

As the result of an employee's suggestion, the S.N.C.F. is developing the use of a device to facilitate the movement of point blades. This device, known as the *dispositif JP*, consists of a small block, mounted on a wheel, which is attached to the point blade. The wheel moves in a special runway on the sleeper, the height of this runway above sleeper level varying from a minimum close to the fixed rail to a slightly greater height when the blade is in the open position.

Where it is necessary to move points by hand, the physical effort is much less with the use of the JP device. Furthermore, since the points blade does not itself rest on the base plate, the oiling of these plates can be dispensed with.

Reconstruction of Macon Bridge

Before the war the usual route for trains from Paris to Geneva was via Macon, Bourg, Ambérieu and Culoz.

In 1944, however, the bridge across the Saone at Macon was destroyed, and since that time trains have proceeded via Dijon and St. Amour to Bourg.

With the electrification of the Paris-Lyons line and the decision to electrify the Ambérieu network, it was decided to complete the reconstruction of Macon Bridge, and by electrifying the Macon-Bourg-Ambérieu line to provide through electrified running from Paris to Geneva on the former route.

The new bridge with an overall length of 653 ft. has now been completed. A framework of seven steel spans were mounted on six masonry pillars resting on the river bed; this framework is 39 in. thick and supports a reinforced concrete deck on which the track is laid in the usual way by means of ballast and sleepers. The total thickness of the deck and steel girders is 6 ft. 1 in. The bridge sections were prefabricated and manoeuvred into position at the site by means of a special launching wagon.

The deck of the new bridge includes conduits for the electric cables to be installed when the line is electrified. Early this year, the first goods train, steam hauled, passed over the bridge, but passenger services will not be recommended until electrification is complete.

Chalon-Dôle Service

With the coming into operation of the summer service, passenger trains have been withdrawn from the Chalon-sur-Saone to Dôle-Ville line (48 miles), and S.N.C.F. operated bus services have been substituted.

Transport of Glass

Some further details are now available of the *lien-cadre* device for the protection of glass during transit, briefly described in our June 25 issue.

The greatest advantage has been found to result by using this arrangement for comparatively long sheets of glass. Four of the *lien-cadre* clamps are fixed around a number of sheets of glass, it being possible to load two of these bundles end-to-end along a low-side open wagon. Each package weighs approximately 1.5 tonnes and they can be loaded five abreast, thus giving a total load of some 15 tonnes. Loading into the wagon is by crane, gantry or pulley block.

Chocking of the load to prevent movement is very easily done as the packages are of standard size. Planks, approximately the thickness of the clamps, are nailed along the floor and reach from the end of the wagon to the clamps at each end, thus preventing endwise movement; to prevent lateral movement, wedges are nailed into place along one side of the wagon against each clamp, the packages being flush against the wall of the wagon on the other side.

To the trader there is a large economy in dunnage, much quicker loading and unloading, and far less breakage. In addition to deriving advantage from these factors, the S.N.C.F. is applying a favourable rate to encourage the development of this traffic.

Locomotive Cylinder Performance—3*

Consumption of steam per cylinder horse-power and thermal efficiency

By E. C. Poulney, O.B.E.

WHILE the several points mentioned have possibly caused some improvement in the mean effective pressures resulting in locomotive cylinders for given working pressures, these are at the best only "half pressures" when viewed in the light of more recent developments in valve gear design. Cylinders cannot show marked improvement in performance relatively to their dimensions with piston valve gears, which must, therefore, surely give place to some form of cam-operated poppet valve application, arranged to provide full inlet port openings at running cut-offs, so reducing to a minimum port restrictions now retarding power output.

While the above is true, it should be well understood that improved "inlet" conditions, unless accompanied with correctly controlled exhaust events, particularly "compression" and pre-admission properly related to cut-offs, will not realise fully the expected results. Admission port openings cannot be too large, especially for high speed operation where full port openings are clearly desirable.

Short rates of cut-off giving in turn extended rates of expansion are required to utilise the available "heat drop" made possible by the use of high pressure superheated steam. However, Fig. 3 seems to show that this is not attained by the use of present valve gears which have outlived their usefulness and at their best offer only a compromise between a series of conflicting conditions. The large-size piston valves forced on designers in an endeavour to get more steam into the cylinders offer on the exhaust side a rate of steam flow inordinately rapid, which tends to reduce the areas of indicator diagrams at early cut-offs and high speeds, so causing some loss in mean effective pressures and possibly offsetting any gains due to improved "inlet" conditions.

Cut-off and Cylinder Efficiency

So far, attention has only been given to the influence of rates of cut-off and speed on indicated mean pressures, and some remarks may now be made on consumption of steam per cylinder h.p. and the corresponding thermal efficiency of the steam action in the cylinders.

A further graph, Fig. 3, shows steam rates per i.h.p. hr. and cylinder efficiencies per cent plotted against i.h.p. The curves are plotted for constant speeds of 60-70 m.p.h. Lines have been added showing the rate of cylinder feed and the steam temperatures.

As this plot relates to constant speeds, it follows that increasing powers are

obtained by lengthening the rate of cut-off per cent. It is clear, therefore, that the lower powers correspond to earlier rates of cut-off. At the lowest rate of cut-off, which in this case is 15 per cent, steam rates are higher than when the cut-off is lengthened to 20 or 25 per cent, and at the same time, therefore, cylinder conversion efficiencies are also relatively low.

With increasing powers at longer rates of admission, steam rates and cylinder efficiencies improve. To bring the boiler into the picture, a curve has been added showing the coal rate lb. per i.h.p.

thus clearly showing the severe throttling taking place during admission when the cut-off is reduced to 15 per cent.

The necessity for a large cylinder volume, if high powers are required at short cut-offs, is therefore readily apparent.

According to the performance data examined, it is probable that the proper expansion of high pressure steam, making full use of the available "heat drop," is not possible with the valves and valve gears now in common use.

Although cylinder efficiencies are reasonably high within a defined range

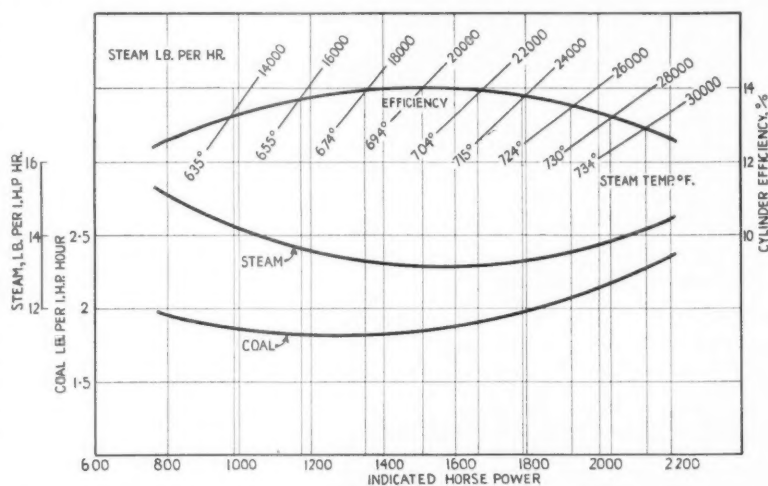


Fig. 3—Cylinder performance of British Railways class "7" locomotive at speed between 60-70 m.p.h.

hr. Here again it will be seen that the fuel required shows a tendency to be rather higher at minimum powers, improving as powers increase.

The reason for the lower efficiencies shown at minimum cut-offs is due largely to the low powers developed caused in turn by the low mean pressures at cut-offs earlier than about 18 per cent and probably also by low steam temperatures. This means that the cylinder feed steam is less highly superheated than is the case when cut-offs are lengthened and the rate of steam flow to the cylinders increased.

It will be noted from Fig. 1 that the mean effective pressure at 273 r.p.m. (60 m.p.h.) and 15 per cent cut-off is for the class "7" engine, 44 lb. per sq. in., while, if the cut-off is lengthened to 25 per cent, the speed remaining the same, the mean pressure becomes 67 lb. per sq. in., representing a gain of 54 per cent, which much exceeds what would be theoretically obtainable by this reduction in the number of expansions,

of power output, any thermal efficiencies then shown are caused entirely by the powers developed in consequence of the relatively greater amount of heat taken into the cylinders, which is in turn caused by the greater superheat present in each pound of cylinder feed and the improved port openings to admission, as shown by Table No. 3 and the resulting mean pressures, Figs. 1 and 2. At maximum powers, efficiencies diminish when decreasing rates of expansion commence to counteract the advantages offered by increasing steam temperatures following augmented firing rates and evaporations.

Present piston valve gears are clearly retarding rather than developing locomotive design and performance. More efficient means, therefore, must be found for the distribution of the steam in the cylinders designed to improve both power output and efficiency. The further development of steam motive power is hinged on the adoption of greatly improved valves and valve actuating gears.

(Concluded)

* Parts 1 and 2 appeared in our issues of July 30 and August 6, 1954

Alternate Single and Double Track Working

Double track signalled for double-direction working alternated with single track with C.T.C. increases line capacity

A NEW track arrangement, consisting of alternate single and double lines with double-direction working, has been put down on a 167-mile section of the Southern Railway System of U.S.A. between Ludlow and Tateville on the route between Cincinnati and Chattanooga. It is claimed that the section capacity has actually been increased by converting the former double line, with trains in one direction using the same track, to the present arrangement with trains travelling on both tracks in either direction.

With normal double track working, automatic block signalling had been provided for right-hand running and 22 single-direction sidings, with hand throw switches for passing of trains travelling in the same direction. Thirty-five crossovers with hand-worked points at various

are concerned in either a crossing movement or a passing or overtaking movement the train being given preference is usually switched on to the straight track.

Nearly all such operations can be made without either train being compelled to stop. Better overall train performance is obtained with the flexibility of the new system as compared with the former double line working. The dispatcher can arrange preference routing of trains as required on a minute to minute basis so that timekeeping by passenger trains and important through freight trains has improved. In addition, the slower freight trains are kept moving.

The new track arrangement with centralised traffic control has proved most successful from the point of view of transportation. The removal of track

tween Ludlow and Tateville, 73.8 miles of the old southbound main track and 11.6 miles of sidings were removed.

One factor in the new system which achieves great economies in time is that the turnouts at the ends of two tracks and the double crossovers between tracks are designed with curvature to permit trains to make diverging moves up to 45 m.p.h. Of corresponding importance is the fact that special signal aspects and controls were installed to direct train crews to bring their trains up to and through these turnouts at such speeds.

The installation is an example of an existing double line being converted to alternate single and double tracks with double-direction working. It does, however, throw a new light on cases where single lines have reached their maximum

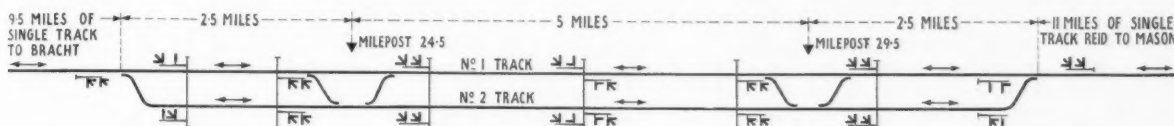


Diagram showing section of double track between Bracht and Reid signalled for double-direction working. New power-operated remote-controlled double crossovers have been installed at mileposts 24.5 and 29.5

stations were used in emergencies for crossing trains from one track to the other.

The conversion included removal of the 35 crossovers and 18 of the sidings. Besides this, various sections of the double line were converted to single, the redundant track being taken up. On the 30-mile section between Rice and Mason, the former southbound main line was removed for over nine miles between Rice and Bracht and for 11 miles between Reid and Mason. This left 10 miles of double track between Bracht and Reid, both tracks now being signalled for train movements in both directions. At milepost 24.5 and milepost 29.5 (see diagram) new power-operated remote-controlled double crossovers have been installed so that trains can be diverted from one track to the other at either location.

The switches at the ends leading to the two tracks, the double crossovers, and signals are controlled by the train dispatcher in the central control office, the train movements being authorised by aspects displayed by these signals. The sections of second track removed were, in all instances, the old southbound main track, so that at each of the new ends of the two-track sections, the No. 1 track on the east side is the straight track and the turnout is to the No. 2 track which was previously the southbound main. If the passing of only one train is involved it is routed to the No. 1 track and no speed reduction is necessary. Where two trains

has also produced a saving in maintenance. As in most cases trains are kept moving on the sections of double track when crossing or overtaking, 22 single-direction sidings were dispensed with. As the diagram shows it is 2.5 miles from Bracht to the double crossover at milepost 24.5 and 2.5 miles from Reid to the double crossover at milepost 29.5. This 2.5 mile interval is standard in the whole project, this distance being chosen for two reasons. When a train enters a 2.5 mile section of the No. 2 track the entire train can take the turnout at the maximum speed permitted (45 m.p.h.) with a second train-length of empty track ahead available in which to stop or to accelerate if the train is to continue on No. 2 track. Also, if necessary under unusual circumstances, two trains can be accepted into one of these 2.5 mile sections.

Factors Involved

Numerous factors were involved in deciding where to remove sections of the former double line. The first consideration was to leave two main tracks through important yards where yard and station switching were important factors. Where train speeds are materially affected by grades and curves double track with two-way signalling was retained to provide better crossing and overtaking. In the Ludlow-Danville territory, the general plan called for alternate sections of approximately 10 miles of single track and 10 miles of double track. Out of the entire 167 miles be-

capacity and the consequent expense of doubling has to be faced. This method would cost less and provide better results.

MALICIOUS DAMAGE TO SIGNAL EQUIPMENT.—A man was charged recently at Hull with having removed on four occasions electric batteries operating coloured light signals on the railway at South Cave, near Hull, North Eastern Region, so causing obstruction. It was alleged in other charges that at Little Weighton he set up a speed restriction board, and that he cut three signal wires at Willerby. This caused obstruction to trains. The prosecution suggested that if the man were released on bail, further offences might be committed with consequent grave risk to railway safety. The accused was committed for trial and was to remain in custody.

WESTINGHOUSE EXHIBITS AT THE COMMERCIAL MOTOR TRANSPORT EXHIBITION.—The Westinghouse Brake & Signal Co. Ltd., will be showing a wide range of apparatus on Stand No. 402 at the Commercial Motor Exhibition. There will be air brake equipment and air-operated accessories for the heavier types of passenger and goods commercial vehicles, including apparatus manufactured to Bendix-Westinghouse designs and specifications. The main exhibit will comprise a group of brake equipments on four panels. The two inner panels will be connected to a centrally controlled point to show the relationship between pedal effort and brake pressure on these layouts by means of an illuminated "live" graph. The exhibition is being held at Earls Court, London, from September 24 to October 2.

New Hydraulic Overloader

Capacity of four loading cycles a minute

A NEW design of mobile hydraulically operated overloader, known as the Weatherill has been developed by F. E. Weatherill Limited, as a result of considerable prototype work. The machine, which is now in full scale production, is said to be the first hydraulic machine of its type manufactured in this country. One of the features of the machine is ease and speed of operation with a minimum of clutch and gear changes. It is capable of four loading cycles a minute.

Depending on the material, 100 tons an hour or more can be handled. The machine is designed to operate in confined spaces and is suitable for tunnelling, road making and maintenance, and other similar engineering works. Discharge height and reach is ample for loading into high-side trucks or railway wagons.

Machine Control

One movement of a single lever only is necessary to complete the whole loading and discharging operation. Furthermore, this movement also incorporates a braking effort which automatically slows down the rate of movement of the side arms at the end of their travel just before the discharge of the load, which has the effect of entirely emptying the scoop.

During operation, the side arms are raised for the first part of their travel by a pair of main rams located on either side towards the rear of the machine. At the extremity of their travel, a set of secondary arms take over and completes the overhead movement of the side arms and scoop. "Crowding" action of the scoop when pulling through the material is embodied, and is achieved by two further hydraulic rams mounted on the side arms.

A point of interest from the safety factor point of view, is that the side



Weatherill hydraulic overloader capable of four loading cycles a minute

arms do not travel past the operator. Obviously the load must pass overhead, and the cab is specially reinforced to provide protection for the operator against spillage. The machine is available with a $\frac{1}{2}$ or one cu. yd. scoop to which digger teeth may be fitted if this feature is desired.

It is an integrally built machine using the Fordson industrial tractor for power and transmission, the four-cyl-

der diesel engine giving 44 b.h.p. at 1,800 r.p.m. The hydraulic pump is driven from the engine crankshaft, and is of the Vickers-Vane type. Front tyres 29 x 8 and rear tyres of 1,200 x 24, are fitted as standard equipment. In general, with the exception of the actual shovel movement, the new overloader conforms in many respects to the Weatherill front-end loading, shovel design.

BHAGALPUR-MANDAR HILL BRANCH, EASTERN RAILWAY OF INDIA.—The name of the Minister for Railways & Transport, who opened this line in April, is Shri Lal Bahadur Shastri, and not as printed in error on page 148 of our August 6 issue.

B.R. CLYDE SHIPPING SERVICES.—British Railways ships in the Clyde estuary are experiencing consistent increases in patronage this year, which to the end of July have totalled well over 300,000 additional passengers in comparison with the same seven months in 1953. During July 893,590 passengers were conveyed between Clyde piers, an increase of 106,500 on last year, while on Glasgow Fair Holiday, July 19, nearly 48,000 passengers patronised the Clyde steamer services, a 100 per cent increase on 1953. The new dual-purpose ferry vessel service between Gourock and Dunoon has been

particularly busy, conveying 3,926 vehicles last month in comparison with 58 vehicles on the same route during July, 1953.

MECHANISATION OF PARCELS STAMP ISSUE.

—British Railways are to mechanise the method of issuing parcels stamps and ledger labels at 322 principal stations, which collectively handle about 70 per cent of the 72,000,000 parcels consignments sent by rail every year. At present, these stamps and labels are printed specially for each station, the parcels stamp being issued in a number of different denominations. In future, both stamps and labels will be printed on the spot by machines, 540 of which are to be installed. Each stamp and label so issued will bear a serial number together with the name of the station, the date, and all other information relevant to the particular consignment. Speedier bookings of parcels will result—an increase

of 8.5 per cent in the rate of booking was obtained during tests—together with a simplification of accounting methods. With the introduction of machines at the principal stations, the fixed-value parcels stamps in use at the remaining smaller stations will be replaced by a new type of "open" stamp upon which the appropriate charge will be separately entered. Thus, pre-printed, fixed-value parcels stamps will eventually cease to be used on British Railways. Economies effected by the change-over will total more than £8,000 a year, representing 40 per cent of the annual printing and other costs incurred under the present system.

The two types of machine to be used, which have been undergoing extensive tests at stations, will be supplied by Westinghouse Garrard Ticket Machines Limited, and T.I.M. (Ticket Issue Machines) Limited.

Electric Locomotives for South African Railways

Main-line units of 3,030 h.p. for passenger and goods services over heavily graded sections

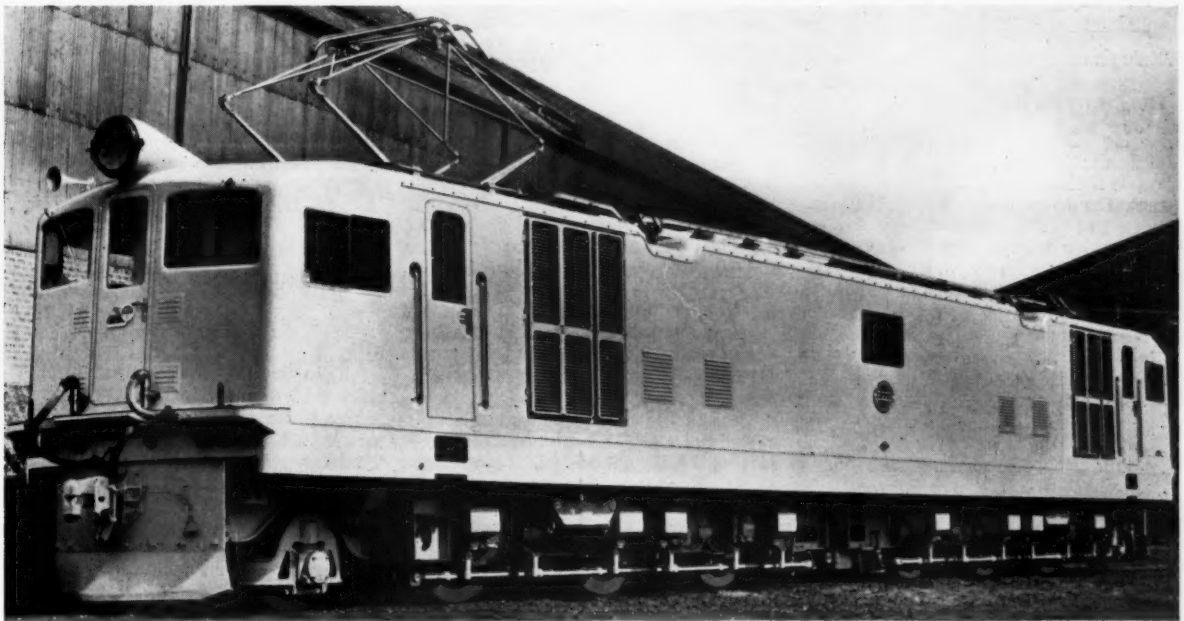
DURING the last 25 years the South African Railways have electrified large sections of their system at 3,000-V. d.c. and have now converted their Cape Western main line between Bellville, near Cape Town, and Touws River, a distance of some 149 miles. From Cape Town to Bellville on this route the previous 1,500-V. d.c. system

is being changed over to 3,000-V. Beyond Bellville, the limit of the Cape Town suburban electrification, the work is entirely new, and was completed to Touws River on May 14 last.

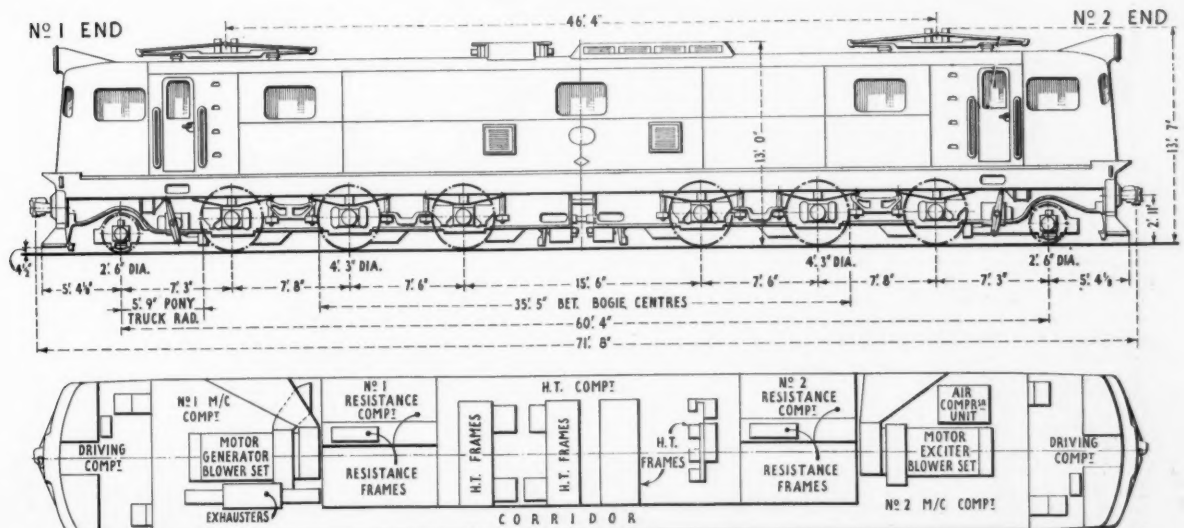
All trains, both passenger and goods, running beyond Bellville are hauled by 3,000-V. d.c. electric locomotives. A contract for 40, "4E" class locomotives

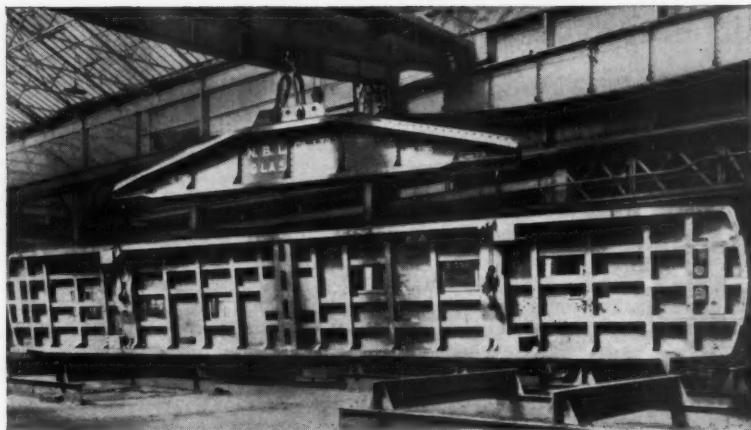
for these services was placed by the South African Railways with the North British Locomotive Co. Ltd., the General Electric Co. Ltd. being the contractor for the electrical equipment.

The locomotives are among the largest yet built for 3 ft. 6 in. gauge. The specified requirements covered both performance and train timings, the



South African Railways "4E" class 3,030 h.p. electric locomotive built by the North British Locomotive Co. Ltd. with electrical equipment by the General Electric Co. Ltd.





Main frame of the locomotive, manufactured in three sections welded together to form a single unit

limiting feature as regards loading being the 20 miles of 1 in 66 grade between Hex River and New Kleinskraat. On down grades the speed had to be kept at the figures quoted in the accompanying table by regenerative braking only. Furthermore, the locomotives had to be capable of starting a 1,070 ton goods train on a 1 in 66 grade, or a 610 ton passenger train on a 1 in 50 grade. The specified haulage requirements are as follow:—

Type of train	Gradient	Max. speed required, m.p.h.
610 ton passenger	Level	56.5
	1 in 100 up	38
	1 in 66 up	34
	1 in 50 up	31.5
	1 in 66 down	40 to 55
900 ton goods	1 in 50 down	30 to 45
	1 in 66 up	25.5 and 30
1,070 ton goods	Level	35
	1 in 66 up	24.5
	1 in 66 down	25 to 40

To meet the foregoing requirements

a 3,030 h.p. six-motor locomotive was provided, with three motor combinations and a moderate range of field control in each combination. Ultimately, 30 of these locomotives will operate on the Cape Town-Touws River section, and 10 in Natal.

General Description

The locomotive is carried on two bogies each with three driving axles and a leading pony axle. The draw-gear is mounted directly on the bogie headstocks, and the tractive-effort is transmitted between the bogies by a link and pins with spherical bushes. These bushes allow freedom for transverse and vertical movement of one bogie relative to the other. The main frame of the locomotive is manufactured in three pieces, subsequently welded to each other, to form a single all-welded unit, with flat rubbing surfaces on the underside of the frame carried on spring-borne bearer pads on the bogies. On each bogie there are two main side-bearers approximately opposite the

pivot, and two end-bearers carrying slightly less weight at the inner and outer ends. The pivots carry neither weight nor tractive forces.

Transverse forces are transmitted from the pony truck to the bogie frame through rocker cams which provide a constant centering force. The bogie running is further stabilised by the friction at the bearers, and by a spring interconnection of special design, which tends to keep the bogies moving in phase, but allows independent movement above a pre-determined controlling force. The pony truck and leading driving axle are fully side and cross equalised, while the other two driving axles are side equalised only.

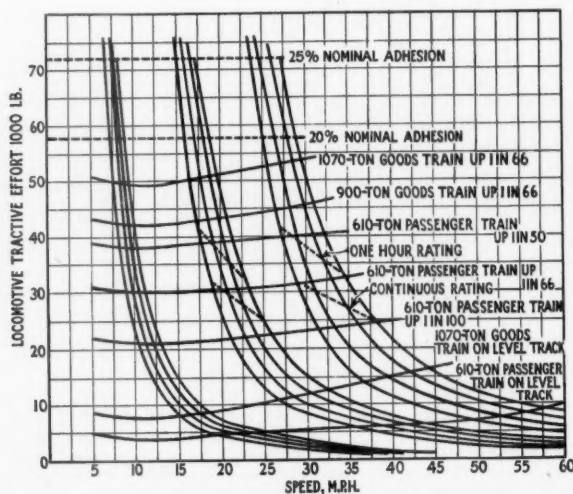
Principal dimensions of the locomotives are:—

Gauge	...	3 ft. 6 in.
Length over couplers	...	71 ft. 8 in.
Bogie wheelbase	...	22 ft. 5 in.
Total wheelbase	...	60 ft. 4 in.
Wheel dia. (driving)	...	4 ft. 3 in.
Wheel dia. (pony)	...	2 ft. 6 in.
Total weight in working order	...	155 tons
Adhesive weight	...	129 tons
Tractive effort at 25 per cent adhesion	...	72,000 lb.
Continuous rating (full-field)	...	32,100 lb. tractive effort at 28.5 m.p.h.
" (weak-field)	...	25,500 lb. tractive effort at 37.6 m.p.h.
One-hr. rating (full-field)	...	41,700 lb. tractive effort at 26.7 m.p.h.
" " (weak-field)	...	33,600 lb. tractive effort at 34.2 m.p.h.

The locomotive body is symmetrically arranged with a driving cab at each end; behind each cab is a machinery compartment, and in the centre portion of the locomotive is situated the enclosed high-tension compartment. The driver's cab houses all the master control equipment. A panel in front of the driver carries the various meters and gauges. Equipment includes a speedometer, mileage counter, regenerative mileage counter, and speed recorder. Behind the driver are the main control switch and circuit-breakers for the lighting circuits. The battery is situated in two cubicles on either side of the



Interior of the driving cab, showing layout and controls



Locomotive performance when motoring

centre front door of the locomotive.

The machinery compartments contain the various auxiliary machines and much of the low-tension control equipment associated with them. In a chamber in the centre of the locomotive is housed all the high-tension power and auxiliary control gear. The ventilation of the high-tension compartment is effected by diverting part of the cooling air from the ducts leading to the traction motors. The whole of the cooling air for the locomotive is filtered.

Control System

Power is collected from the overhead line by one or other of the pantographs; all the circuits are fed through a main isolator interlocked with the high-tension chamber door and pantograph control. The locomotive performance demands three groupings of the six driving-motors both when motoring, and regenerating, namely, series, series-parallel and parallel. The motors are thus connected in series across the line as one group of six, two groups of three, or three groups of two. Control is by means of electro-pneumatic contactors operated from the master controller.

Changing from one combination of motors to another is by shunt transition which maintains a suitable draw-bar pull during re-grouping. In each combination four continuous-running steps are provided by field excitation control. When regenerating, the motor fields are separately excited from a variable voltage exciter, and the inverse compound regenerative characteristic ensures stability. Lightning protection is by means of a double spark gap and a surge absorber, both mounted on the roof, and auxiliary spark gaps with blowouts in the power and auxiliary circuits; the insulation of all high-tension

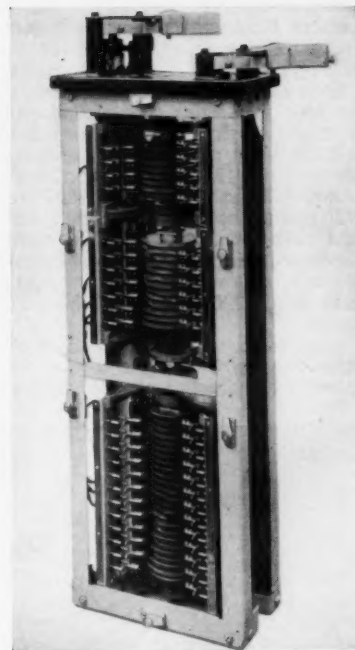
equipment is designed to withstand 10,500 V. a.c.

The power contactors are electro-pneumatically operated, and the master controller handles only small currents at 112 V. for operating the valves. A comprehensive system of interlocks ensures correct sequence in all circuit changes and accords full protection in the event of failure of any component. The master controller has three handles. The first selects forward or reverse running as well as the various motor combinations; the second controls the cutting out of starting resistance during motoring and regenerative braking, the final notches of this handle operating field-weakening contactors in any motoring combination. Field weakening is not available when the motors are regenerating. The third handle sets up the regenerative connections, and controls the exciter voltage. As the locomotive has a crew of two, no dead man's features are provided.

Fault Protection

Should over-current or over-voltage relays operate, starting resistance sections are at once connected in the circuit, followed by further sections, and finally, by the opening of the line switches. If a motor fails, the three motors on either bogie may be isolated, and the locomotive safely operated with a limited performance. All the locomotives are provided with control train lines and couplers to permit multiple-unit operation so that more than one locomotive can be driven from one cab.

The control of a locomotive of this class involves much specially developed equipment, and as it is associated both with the 3,000 V. and 112 V. circuits, insulation is of prime importance. For safety, the high-tension side is earthed,



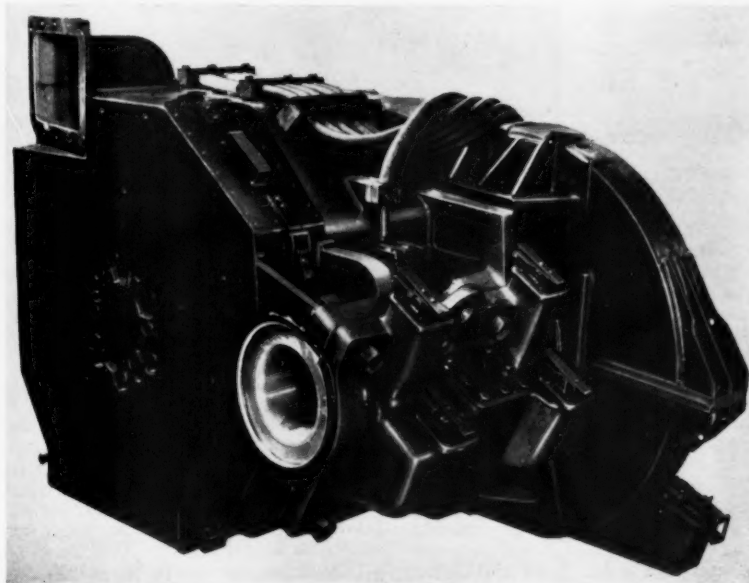
Locomotive master controller, showing arrangement of drums and cam-operated contacts

but the low-tension circuits are not earthed. This is because there may be a very high resistance to earth if sand or dirt is blown on to the track. Furthermore, there is always the equivalent of an earthed barrier between low- and high-tension circuits when associated with one piece of apparatus.

The pantograph is of lightweight, heavy-duty construction, the main feature of which is the arrangement of the pans which neutralises the drag action due to friction. The main 3,000 V., 300 amp. contactors are electro-pneumatically operated, and are tested with currents exceeding 8,000 amp. and voltages up to 4,000. A small 3,000 V. clapper-type solenoid-operated auxiliary contactor is built on similar lines.

The main change-over cam groups employ an insulated bar construction carrying the fixed and moving contacts; a centre shaft carries the Bakelite cams to operate the contacts, which are spring-closed and cam-opened. The master controller also employs cam-operation, with silver butt contacts. There are three drums on the same centre, the top being the reverse and combination drum, the middle the regenerative, and the bottom the main resistance and weak field drum.

The resistances are subjected to very arduous duty because of the steep grades and heavy loads hauled. They are of special corrosion-resisting cast iron, and the grids are carried on Micanite insulated bars. On each bar a take-up spring is provided to obviate trouble should slack develop, which would



One of the traction motors of the "4E" class locomotives

otherwise cause burning of the contact surfaces. Field weakening and regenerative stabilising resistances are of the strip type.

Each axle-length traction motor is of the four-pole series type, force-ventilated, and weighs $5\frac{1}{2}$ tons. Motor ratings at 1,450 V. in accordance with British Standard No. 173/1941 are: continuous rating, full field, 232 amp., 420 h.p., 672 r.p.m.; continuous rating, weak field, 242 amp. 440 h.p. 888 r.p.m.; one-hour rating, full field, 282 amp., 505 h.p., 630 r.p.m.; one-hour rating, weak field, 290 amp., 525 h.p., 807 r.p.m.

Each motor is suspended from the bogie transom by a nose cast on the frame and resting in a cradle carried on

so that there is no risk of dirt entering the housings during this operation. Hard mica wraps, moulded on to the coils, insulate the slot portion of the armature windings. The whole is consolidated, while hot, all interstices being filled with insulating cement. Armature failures have, in the past, resulted from the melting of solder in the commutator joints, and for this reason solder is used which does not become plastic until a temperature of 236 deg. C. is reached.

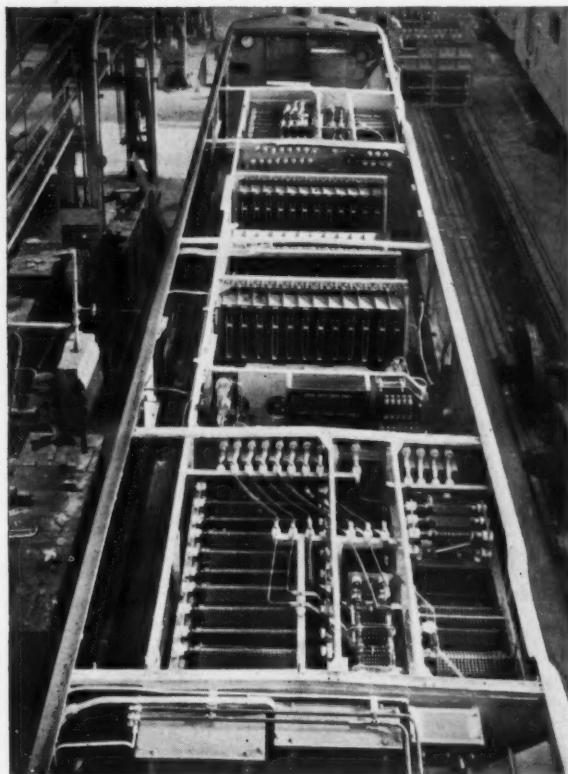
Field Coils

The field coils are formed of copper strip with interturn insulation of treated asbestos; the main insulation is cambric-backed mica with an outer taping of asbestos. The final polymerisation of

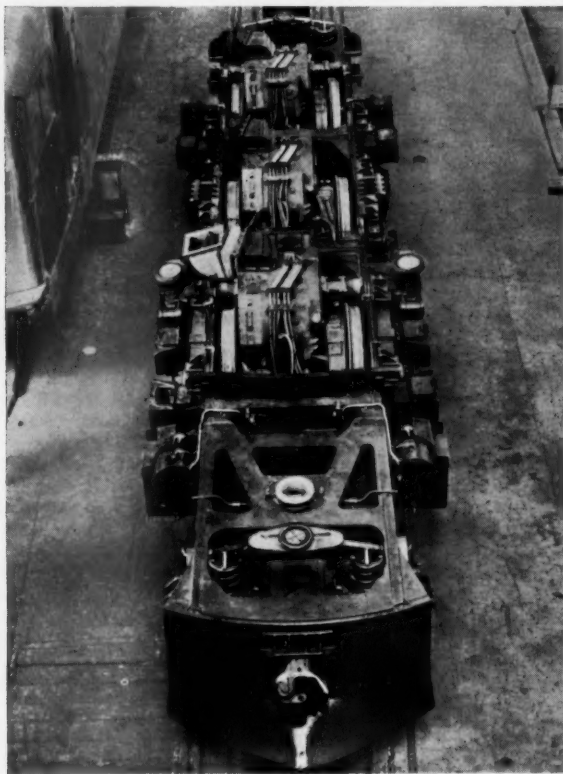
resilience is obtained by using two Silentblocs in series, one mounted in the rim, the other in the hub, with a steel pin forming the connecting link.

Auxiliaries

Each locomotive is provided with a 43 kW. motor exciter set which energises the motor fields when regenerative braking is used, and a 22 kW. motor generator for supplying the low-tension, power and lighting circuits. Incorporated in each set is a blower which supplies the cooling air for three of the traction motors. Both motor and generator armatures are mounted on a common shaft with the field system housed in a single fabricated frame. The driving motors are two-pole



High-tension compartment of the locomotive



Motor bogie and pony truck

rubber pads. Manganese steel wearing surfaces are provided on the nose and cradle. The lateral forces imposed on the track are considerably reduced by allowing the motor a limited amount of transverse movement relative to the axle under the control of rubber springs between the motor and the bogie frame. The suspension bearings are clamped in position by a single cast-steel axle cap, located by large spigots and secured by bolts. Lubrication of the suspension bearings is effected by oil syphoned through wool packing from a large reservoir in the axle cap.

The armature is carried in grease-lubricated roller bearings and can be removed from the motor frame without opening up the bearing assemblies

the impregnated synthetic resin varnish gives coils of great strength with excellent insulation and heat dissipation properties. Studs of fatigue-resistant alloy steel with non-magnetic bushes fix the interpoles to the motor frame. This construction, for which a patent application has been made, coupled with careful grading of the interpole gap, ensures proper interpole strength and greatly assists commutation.

The motors drive the axles through single spur reduction gearing manufactured by Alfred Wiseman Limited. The resilient gearwheels comprise a carbon-chrome toothed rim mounted on a cast-steel hub, the drive being transmitted from rim to hub through Silentbloc rubber units. A high degree of

machines operating from the 3,000 V. supply. The exciter and low-tension generators are four-pole machines. The equaliser connections of the exciter form part of the commutator assembly, and are entirely separate from the main winding.

On the 22 kW. set, the blower takes sufficient load to permit the use of a series-wound driving motor, but for the 43 kW. set an additional field is provided on the motor to limit the speed range between maximum and no load on the generator. Both the exciter set and the low-tension motor generator are force ventilated.

The driving motors of the exciter and low-tension generator are protected by
(Continued on page 186)

Proposed Underground Line for Melbourne

Four-track loop of Victorian Railways electric suburban system to relieve congestion on existing lines



North Melbourne Station, near which the north-western end of the underground line will come to the surface

ON May 4 the Governor-in-Council received a report from the Victorian Parliamentary Public Works Committee recommending that construction of an underground railway estimated to cost £15,000,000 should commence as soon as possible. It is expected that the project would take some three-five years to complete.

The proposed new railway would run under the city of Melbourne and its route would be: Leave the existing Eastern and Southern suburban lines about half way between Richmond and Flinders Street Stations, where it would start underground; travel north to the east end of Lonsdale Street and then westward down Lonsdale Street; and turn north-west and come above ground again connecting with the Western suburban lines near North Melbourne Station.

Four separate tracks would be constructed throughout its length and underground stations are proposed at three points, namely, the corners of: Exhibition and Lonsdale Streets; Elizabeth and Lonsdale Streets, and King and Lonsdale Streets.

Access to the stations would be by stairways or escalators according to the depth. It is not proposed that the railway should pass under any buildings. Most of it would be built by cut-and-cover, but some tunnelling would be needed at Spring Street and from Wellington Parade to Lonsdale Street.

Existing Suburban Traffic Arrangements

The present suburban traffic arrangement, broadly speaking, is routing of electric trains from the eastern suburbs

through Flinders Street along a viaduct to Spencer Street Station, and on to North Melbourne, where the lines diverge to the north-western or western suburbs.

Trains from the west then pass through the two city stations on their way east again. Exceptions to this

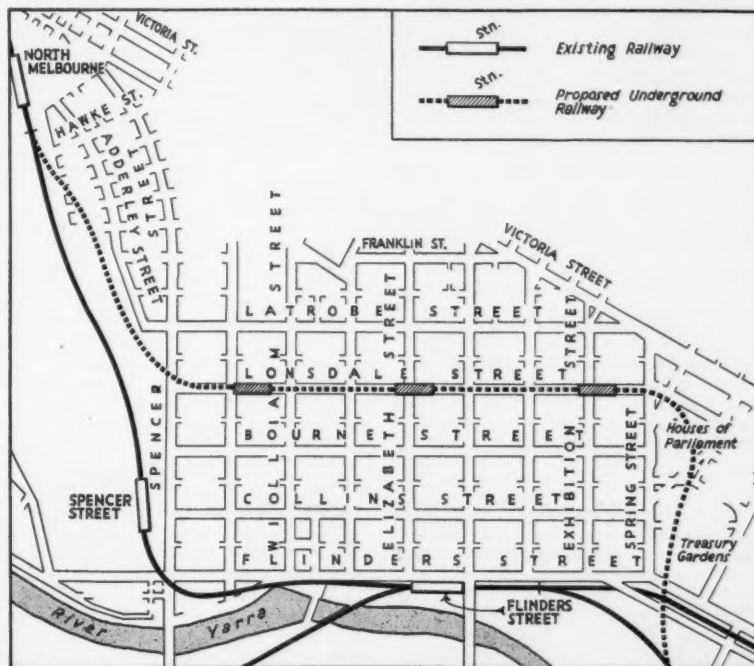
through routing are certain services which terminate at Flinders Street or at Princes Bridge at the eastern end of Flinders Street Station.

Spencer Street Station at the south-western corners of Melbourne is the main country terminus but has a number of platforms for the through running of suburban trains. Both the Sydney and Adelaide inter-State expresses leave from there and pass over the suburban tracks through North Melbourne. North Melbourne is the site of the main locomotive depot and extensive freight yards are also situated there.

Proposals for a loop line of this nature were discussed as far back as 1927, when traffic congestion was not nearly as acute as it is today. By 1960, at least 300,000 persons will be coming into the city daily by rail, and Flinders Street is already working at full capacity. It is estimated that the population of Melbourne will reach 2,000,000 in the next 20-30 years, and 2,500,000 by the end of the century.

Reasons for Recommendation

The reasons given by the Public Works Committee for constructing an underground railway were: (a) pedestrian congestion and road traffic would be eased; (b) walking time would be saved by city workers in reaching a railway or in walking from



Route of proposed underground line, showing relation to principal thoroughfares and existing lines of Victorian Railways



Six suburban tracks between Richmond and Flinders Street near Jolimont Junction. The proposed line will go underground near this point and turn northwards to Lonsdale Street

the station to their places of business; (c) shoppers and theatregoers would be able to be transported reasonably close to their destinations; (d) accidents would be minimised, because the underground railway would save many people crossing busy streets; (e) overall travelling time would be saved by many; and (f) road congestion would be reduced because the railway would attract many who travel by private car and also induce inner suburban residents to use the train in preference to trams. Re-development of the northern end of the city could be expected closely to follow construction of the underground line, particularly in areas close to the new underground stations.

The Government of Victoria is stated to be determined to make a start on the project by preparing with the Railways Commissioners a phased

works programme, to ensure that work could proceed by stages as finance became available. It has been proposed that in the initial stages a line should be built from Jolimont, between Richmond and Flinders Street, to the eastern end of Lonsdale Street. A line to this point would immediately serve large numbers of workers employed in the north-eastern areas of the city and would consequently take away much congestion from Flinders Street Station.

Associated Projects

While early construction of an underground line beneath the centre of the city would relieve congestion at Flinders Street, there are also serious difficulties being experienced on two other important groups of suburban lines, which pass the point where the proposed underground line would go

underground between Richmond and Flinders Street. The lines referred to are those from Flinders Street to Caulfield and Box Hill which both pass through Richmond Station, diverging beyond it.

The Box Hill line carries heavy passenger traffic to the eastern suburbs and to the country districts beyond, while the line to Caulfield carries the south-eastern suburban traffic to Oakleigh and Dandenong and also to the bayside suburbs on the line to Frankston for which Caulfield is the junction. The line to eastern and south-eastern Gippsland also passes through Caulfield.

Heavy peak period traffic has become a serious problem with both these groups of lines. Works already planned for relieving this are designed for co-ordination with the building of an underground line and the subsequent further extension of facilities on suburban lines.

Urgent needs are stated to be increased track capacity from Jolimont Junction, between Flinders Street and Richmond, to Burnley on the Box Hill line and to South Yarra on the Caulfield line. The Caulfield line was duplicated between South Yarra and Caulfield many years ago, and in recent years duplication has been partially completed between South Yarra and Richmond. Major works planned for these two important groups of lines include completion of the duplication from South Yarra, re-building and re-arrangement of Richmond station and provision of flyovers between Richmond and Flinders Street.

New tracks and a new station at Richmond necessitate demolition of certain properties, some owned by the Victorian Railways and some privately owned and occupiers have been notified of this. It will be necessary for the Railway Department to obtain possession of 15 houses, two factories and a hotel in the area to make way for the railway works.

Electric locomotives for South African Railways

(Concluded from page 184)

a circuit breaker which can also be set and tripped by hand and functions as a means of starting and stopping the machines. Current from the low-tension generator is used for battery charging, the fields of the exciter set, for the two exhaustor motors, compressor motor, lighting, control-circuits and heaters.

All the machines have automatic starting equipment to limit the starting current peak. Lighting and control circuits are protected by circuit breakers, no fuses being used. The battery floats across the low-tension generator, and supplies the lighting and control circuits if the generator is not running. In an emergency the battery can be used to supply power to the exhaustors for a limited period.

The Westinghouse brake equipment provides straight air brakes on the locomotive and means for operating vacuum brakes on the train. Regenerative braking is interconnected with the mechanical brakes so that in the event of failure during regeneration the vacuum brakes are automatically applied. The compressor is automatically controlled, and supplies air through the main reservoir for the locomotive brakes, sanding, horn, control, and pantograph equipment. Two vacuum exhaustors operate the train brakes.

The Westinghouse exhaustors are driven by 110 V. series motors—the armature is mounted on an extension of the exhaustor crankshaft, while the motor frame is spigoted to the crankcase. The brake rigging is fully compensated with brake blocks on each side of the twelve driving wheels, each bogie having two brake-operating cylinders. An automatic slack-

adjuster allows for wear of brake blocks and tyres. Air sanding is operated by electro-pneumatic valves controlled by the driver. Each bogie has eight sanding boxes so that, for either direction of travel of the locomotive, eight wheels are directly sanded.

ENGLISH STEEL CORPORATION EXHIBITS AT MILAN.—A comprehensive range of engineers' cutting tools and equipment will be displayed by the English Steel Corporation Limited at the International Machine Tool Exhibition to be held in Milan on September 14-23. Exhibits will include Easicut Blue drills, S.R. boring cutters, adjustable machine reamers with micrometer adjustment, tool bits, cutters, Escaloy cemented carbide tools, and Super Cyclone turning tools. Other exhibits will include a full range of files and hacksaw blades, and a 3 in. by 12 ft. mould for the centrifugal casting of pipes.

RAILWAY NEWS SECTION

PERSONAL

We regret to record the death, on August 8, at the age of 71, of Mr. John P. Taylor, formerly Editor since its inception of our associated weekly contemporary *Ship-building & Shipping Record*. Mr. Taylor, who was the first Editor of that journal, retired on July 31, 1953. During the 40 years of his editorship he was well known to a large number of officers of British

Government Railway as Traffic Manager. In May, 1942, Mr. Bunning returned to the Nigerian Railway with the appointment of Chief Traffic Superintendent; he did not take up that position, however, as on arrival he was promoted Deputy General Manager. He acted as General Manager for periods during 1943, and was appointed General Manager in 1944. On January 1, 1948, he became Adviser on Inland Transport to the Secretary of State

French territory of Chad. He later visited the Gambia at the request of that Government to discuss the organisation of marine vessels and the future organisation of river and road transport.

Colonel Gavin B. Thomson, M.B.E., who, as recorded in our July 16 issue, has been appointed General Manager of the British Guiana Government Railways, was born on January 6, 1906. He gained early railway



Mr. A. J. F. Bunning

General Manager,
British Guiana Government Railways, 1952-54



Colonel G. B. Thomson

Appointed General Manager,
British Guiana Government Railways

Railways, particularly those associated with the marine department. One of his sons, Mr. F. P. B. Taylor, is serving on British Railways in the capacity of Assistant (Services & Finance) to the Regional Manager of the Southern Region, Mr. C. P. Hopkins.

Mr. A. J. F. Bunning, C.M.G., General Manager of the British Guiana Government Railways, who, as recorded in our July 16 issue, has completed his term of contract, was born in 1895, and was educated at Newport (Monmouthshire) High School & Technical College. He entered the G.W.R. Traffic Department in 1912. He served in France, Germany, and Poland during the 1914-18 war and was demobilised at the end of 1920. In 1921 he joined the Eastern Railway Construction of the Nigerian Railway, and, in 1927, went over to Open Lines as Assistant Traffic Officer. He was promoted District Traffic Superintendent in 1936. Three years later he transferred to the Gold Coast

for the Colonies, and subsequently travelled extensively in the interests of colonial transport, visiting Kenya and Uganda, Tanganyika, Northern and Southern Rhodesia, Nyasaland, and Johannesburg. He visited Mauritius in 1949 at the request of the Mauritius Government to report on transport and to make recommendations for the future of the Mauritius Railway. From there he proceeded to Kenya and thence to Singapore via India and Ceylon, subsequently visiting Malaya, Penang, North Borneo, and Sarawak. In 1950, he visited Sierra Leone on the invitation of its Government to investigate and report on the economics and possible future development of the Sierra Leone Railway, and later in that year attended the Johannesburg conference on transport matters in Africa south of the Sahara. From Johannesburg he went to French West Africa to attend a conference held at Dschang in the French Cameroons to consider transport problems in relation to the development of the

experience with the former London & North Eastern Railway, on which he served for sixteen years in the passenger and goods departments, and the development section. During the 1939-45 war he served in Movement Control Railway Branch, Middle East Canal Zone; Railway & Port Operation in Iraq; and in the Sicilian and Italian campaign from 1943 until the end of hostilities. He was retained in Italy in charge of the overland rail services from Milan to the Channel via Switzerland until May, 1946, attaining the rank of Colonel, and subsequently being gazetted with the honorary rank of Colonel. He was twice mentioned in despatches. From September, 1946, until December, 1951, Colonel Thomson was with the Railway Branch of the Control Commission in Germany as Railway Assistant to the Chief of the British Transport Division in Berlin, in which capacity he was engaged on inter-allied railway arrangements for the restitution of rolling stock. During the blockade of Berlin he was on the staff of the Military Governor in an advisory capacity,



Mr. G. M. Thompson

Appointed District Motive Power Superintendent
Eastleigh, Southern Region



Mr. R. H. Williams

Appointed Senior Railway Employment Inspector,
Ministry of Transport



The late Mr. A. Collingwood Lermitt

Works Secretary, Vulcan Foundry Limited
1910-1950

and later joined the Joint American-British Railway Headquarters. Colonel Thomson was appointed Traffic Manager, British Guiana Rail, Road, Shipping & Ferry Services, in January, 1952, the position he now leaves to become General Manager of the British Guiana Government Railways.

Mr. G. M. Thompson, Assistant District Motive Power Superintendent, Woking, Southern Region, British Railways, who, as recorded in our July 16 issue, has been appointed District Motive Power Superintendent, Eastleigh, was educated at the Imperial Service College. He entered the service of the London & North Western Railway in 1922 as a Premium Apprentice at Crewe Works, where he was a pupil of Mr. M. P. M. Beames, the then Chief Mechanical Engineer. After a period in the Drawing Office at Crewe he became an Improver Fitter at the Derby Sheds of the Midland Division of the London Midland & Scottish Railway. He subsequently became Runner to the then Divisional Motive Power Superintendent, Derby, and, later to the Superintendent of Motive Power. Subsequent appointments included Running Shift Foreman, Buxton Motive Power Department; Shed Foreman, Rowsley Motive Power Department; Running Shift Foreman, Toton (where he acted as Assistant District Motive Power Superintendent and Foreman Fitter), and Running Shed Foreman, Agecroft, Central Division, L.M.S. During the 1939-45 war Mr. Thompson served as a pilot in the R.A.F. with the rank of substantive Flight-Lieutenant, and, on release from H.M. Forces, he returned to the railways as District Motive Power Superintendent at Chester. He subsequently became Assistant District Motive Power Superintendent, Nine Elms, Southern Region, from which position he was appointed Assistant District Motive Power Superintendent, Woking. Mr. Thompson holds a commission as Captain 157 Locomotive Running Squadron, R.E. (A.E.R.).

Mr. Leslie M. Sayers, District Operating Superintendent, Nottingham, London Midland Region, British Railways, has been appointed Divisional Operating Superintendent, Crewe.

Mr. R. H. Williams, A.M.I.C.E., A.M.I.Mech.E., who, as recorded in our July 23 issue, has been appointed Senior Railway Employment Inspector, Ministry of Transport, served his apprenticeship at Crewe Works, London & North Western Railway. From 1914 to 1919 he saw war service in France, and, after demobilisation, he was appointed Assistant to the Steel Works Manager at Crewe, a position he retained on the formation of the L.M.S.R. and until 1927. Thereafter he was employed in supervising outstation repair shops, and was later appointed Assistant to the Works Superintendent, in which capacity he acted as liaison officer between Crewe works and the Permanent Way and Signal & Telegraph departments. This position Mr. Williams resigned to take up the appointment of Railway Employment Inspector with the Ministry in 1936.

We regret to record the death, on August 7, at the age of 70, of Major George Rutherford Dain, C.I.E., formerly Principal of the Government of India School of Transportation. Major Dain, who was educated at Tonbridge and Clare College, Cambridge, joined the East India Railway Company in 1907. He ended his career in India as Manager of Calcutta Tramways.

Mr. P. J. Fahey, Signal & Telegraph Engineer, New South Wales Government Railways, retired on July 31, after nearly 49 years of railway service. He has been succeeded by Mr. D. J. Vernon, Chief Assistant Signal & Telegraph Engineer.

Mr. J. H. Hambidge, Assistant District Operating Superintendent at Leicester, London Midland Region, British Railways, has been appointed District Operating Superintendent, Stoke-on-Trent.

Mr. S. R. Walker, Assistant District Motive Power Superintendent, Edinburgh, Scottish Region, British Railways, has been appointed District Motive Power Superintendent at Thornton, Fife.

Mr. O. D. Angell has joined the board of the British Vacuum Cleaner & Engineering Co. Ltd.

We regret to record the death on July 31, in his 66th year, of Mr. A. Collingwood Lermitt, Works Secretary, Vulcan Foundry Limited from 1910 until his retirement in 1950. Mr. Lermitt was educated at Kingsgate House, Winchester, and, on leaving school, spent two years in France learning the language. He joined the Vulcan Foundry Limited in 1907 as Assistant to the Works Secretary, and was appointed Works Secretary in 1910. Mr. Lermitt represented the Vulcan Foundry at meetings of the Locomotive Manufacturers' Association from 1936 until his retirement, and he served on numerous sub-committees of the Association. He acted as Honorary Secretary of the Vulcan Institute Committee from its inception in January, 1946, and always took an interest in social activities connected with the Institute and in matters concerning the Vulcan Village Housing Estate & School.

Mr. F. G. Burland, who, since 1939 has been in charge of the London Transport Executive's Permanent Way Design Section, is retiring this month.

Mr. R. A. Green has been confirmed in the position of Assistant Signal & Telecommunications Engineer, Eastern Region, Kings Cross, British Railways, which position he has been filling in an acting capacity since August, 1952.

Mrs. M. H. Neal and Mr. J. D. Lusty have been appointed to serve for a further period as additional members of the Transport Users Consultative Committee for the East Anglia Area.

Alderman E. Porter, J.P., has been appointed to serve for a further period as an additional member of the Transport Users Consultative Committee for the North Western Area.

Mr. J. B. Taylor, T.D., Manager of the Leicester branch of the General Electric Co. Ltd., has been appointed Managing Director of British General Electric Co. (Canadian) Ltd., in succession to Mr. J. S. Langlands, who is to be District Assistant Manager of the General Electric Co. Ltd.

in Scotland. Mr. K. L. V. Nichols is to be Manager of the company's Leicester branch.

The Plessey Co. Ltd. announces the appointment of Mr. John Hilton and Mr. C. D. H. Webb as executive directors of the company.

Mr. K. E. Garcke and Mr. P. L. Fleming have been re-elected to the board of the British Electric Traction Co. Ltd.

Taylor Bros. & Co. Ltd. announces that Mr. R. E. G. Mayhew has resigned his appointment as a Director of the company.

Mr. G. W. Bone, M.I.Mech.E., has been appointed a Director of Ruston & Hornsby Limited.

Mr. Bernard C. Lovatt has been appointed Chief Engineer of the Parsons Engineering Co. Ltd.

Mr. J. W. Martin, London Divisional Sales Manager, Shell-Mex & B.P. Ltd., has been appointed Western Divisional Sales Manager.

Mr. Godfrey Rigby, O.B.E., G.M., E.R.D., General Manager of the Vulcan Foundry Limited, has been appointed a Director of Robert Stephenson & Hawthorns Limited, with effect from July 14, 1954.

Mr. Albert Jackson, General Works Manager of the Appleby-Frodingham Steel Co. Ltd., has been appointed a Director of the company, which is a branch of the United Steel Companies.

We regret to record the death on July 29, at the age of 68, of Mr. G. O. Houghton, Manager of the London Office of Norris, Henty & Gardners Limited for the past 28 years. Mr. Houghton joined the company in 1916, and was appointed a Director in 1926.

The Wellman Smith Owen Engineering Corporation Limited announces that Mr. C. J. Barker has been appointed General Managing Director of the company. Mr. F. H. Brooks has been appointed Managing Director in charge of production and technical development.

The Queen has approved that a viscounty be conferred upon Mr. Oliver Lyttelton, who, until his resignation at the end of last month, had been Colonial Secretary since 1951. Mr. Lyttelton, who is 61, gave up his position as Chairman of Associated Electrical Industries to serve as a member of the government, and has now returned to industry.

Mr. Claud Barrington, Mr. David Blee, and Mr. H. E. Osborn (British Transport Commission nominees) have joined the board of the Atlantic Steam Navigation Co. Ltd. Major-General G. S. Szlumper, C.B.E., T.D., having reached the age of 70, has decided to retire from the board of the Atlantic Steam Navigation and its subsidiary, Frank Bustard & Sons Ltd.

Mr. F. A. Hurst, Chairman, and Mr. C. F. Hurst and Mr. F. A. Martin, Directors of Samuel Osborn & Co. Ltd., have joined the board of low Moor Alley Steelworks Limited. Mr. C. F. Hurst and Mr. Martin will act as Joint Managing Directors of that company, control of which was recently acquired by Samuel Osborn & Co. Ltd.

Smoking in Passenger Vehicles

Smoking in non-smoking compartments of British Railways passenger vehicles is the subject of a recent letter from Mr. J. H. Brebner, Chief Public Relations Officer, British Transport Commission, in a letter published last week in *The Manchester Guardian* in reply to a complaint from a correspondent, of such smoking by other passengers.

Mr. Brebner points out that:—

1. Smoking in a non-smoking compartment is prohibited and is an infringement of a railway by-law. The staff have definite instructions to take appropriate action upon observing or having their attention called to passengers offending in this way.

2. The question of displaying a larger or more prominent notice has been considered from time to time, but it is felt that the existing labels are adequate; whatever kind or size of warning notice were displayed would not, however, greatly influence people who do not respect the feelings of other passengers.

3. The agreement of other passengers does not authorise smoking in a non-smoking compartment.

Non-smoking compartments are provided for the express convenience of passengers to whom smoking is objectionable, and the British Transport Commission is most anxious that their feelings should be respected.

Visit of Mr. D. H. C. du Plessis to East Africa

Mr. D. H. C. du Plessis, General Manager of the South African Railways & Harbours, disembarked at Mombasa on July 23, so breaking his return journey to South Africa from the International Railway Congress in London and a tour of several European countries where he visited railway, harbour, and airline installations and studied the possibility of recruiting staff for his administration in South Africa.

At Mombasa, Mr. du Plessis took the

opportunity of seeing the harbour and the construction in progress in the port area.

He was welcomed at Nairobi West Airport by Sir Alfred Vincent, Chairman of the East African Airways, with whom he stayed whilst in Nairobi and with whom he discussed matters of mutual interest as to airline operation in Africa.

Tour of Nairobi Workshops

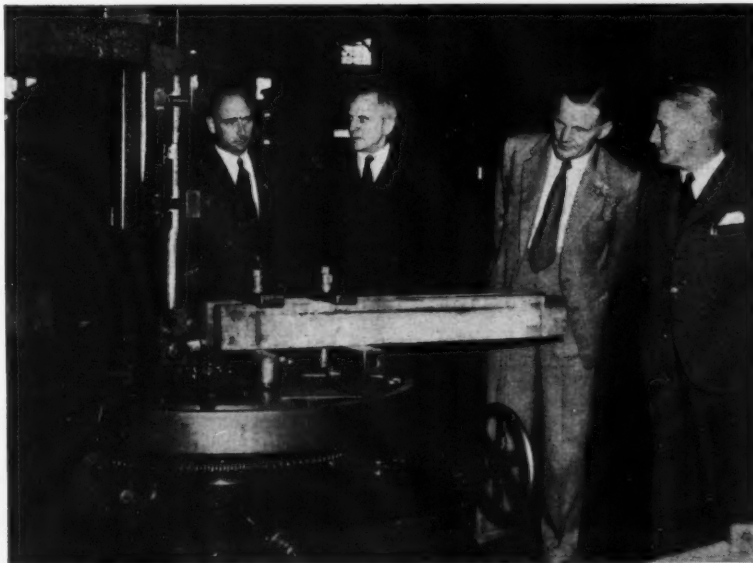
Whilst in Nairobi, Mr. du Plessis, accompanied by Mr. A. F. Kirby, General Manager of the East African Railways & Harbours, toured railway headquarters offices and railway installations, including the mechanical workshops, where he saw many of the new wagons, now arriving in increasing numbers, being assembled, and the three storey flats for African staff.

Mr. du Plessis was particularly interested in personally seeing how a system as large as E.A.R. & H. operates with oil-burning locomotives, for in South Africa coal is used almost exclusively.

On July 26 Mr. du Plessis left Nairobi for Nakuru to inspect the new goods and locomotive sheds and buildings under construction. On his journey he was able to see one of the more dramatic features of E.A.R. & H., the descent of the Great Rift Valley escarpment. Accompanied by Mr. Kirby, he then travelled to Jinja, where they visited the Owen Falls Dam.

The next stage of the tour was to Kampala and Entebbe, whence Mr. du Plessis returned by air to Mombasa and thence by sea to South Africa.

MALICIOUS DAMAGE TO RAILWAY WAREHOUSE.—Two boys were accused at Liverpool juvenile Court recently of unlawfully and maliciously setting fire to a railway warehouse at Wavertree and Edge Hill goods yard on June 8, and of breaking and entering a warehouse with intent to steal. Mr. J. Parry, prosecuting, said that the warehouse was completely destroyed together with a quantity of goods stored there. Eight railway goods vans were badly burned and two motor vehicles damaged. Damage was estimated at £15,000.



At Nairobi Workshops. Left to right: Messrs. J. Hudson, Assistant Chief Mechanical Engineer; D. H. C. du Plessis; A. F. Kirby; and G. Gibson, Chief Mechanical Engineer

Ministry of Transport Accident Report

Sheffield, January 25, 1954: British Railways, Eastern Region

Colonel D. McMullen, Inspecting Officer of Railways, Ministry of Transport and Civil Aviation, inquired into the collision which occurred at about 6.6 p.m. on January 25, 1954, outside Victoria Station, Sheffield, when the 11.16 a.m. eight-coach express, Bournemouth to York, about to start from the home signal of No. 5 signal-box, was run into at 12-15 m.p.h. by a light engine travelling tender first which had been allowed to enter the section irregularly under a clear starting signal at Woodburn Junction box. Nineteen passengers and four railway servants were injured, of whom four and three respectively were conveyed to hospital, but not detained. The remainder received first

(iii) take immediate steps to have the failure rectified and, when done, re-introduce normal working.

British Railways' Rule 38 lays down that the signal controlling admission to the section shall not be cleared while such special circumstances obtain and that drivers shall proceed into the section only on the verbal authority of the signalman.

The two signalmen complied with item (i) above but did not stop trains and warn crews, nor comply with Rule 38. For this neither could offer any explanation. The lineman, advised of the bell failure by the man at No. 5 box, arrived at about 5.20, tested the bells and found them in order, but the signalman did not revert to

looked at his instruments, saw the block indicator for the section in advance normal, and that for the one in rear at "train on line," formed the erroneous impression that the train must have passed on to the station and the block been cleared behind it, and that he had forgotten to give "train out of section" for it himself. Without looking out of the box he replied that the train had gone and returned the block indicator to normal. He was then asked for "line clear"—again by telephone—for the light engine and gave it. The engine had been about 4 min. at Woodburn Junction starting signal, which was then cleared, in the circumstances, contrary to rule.

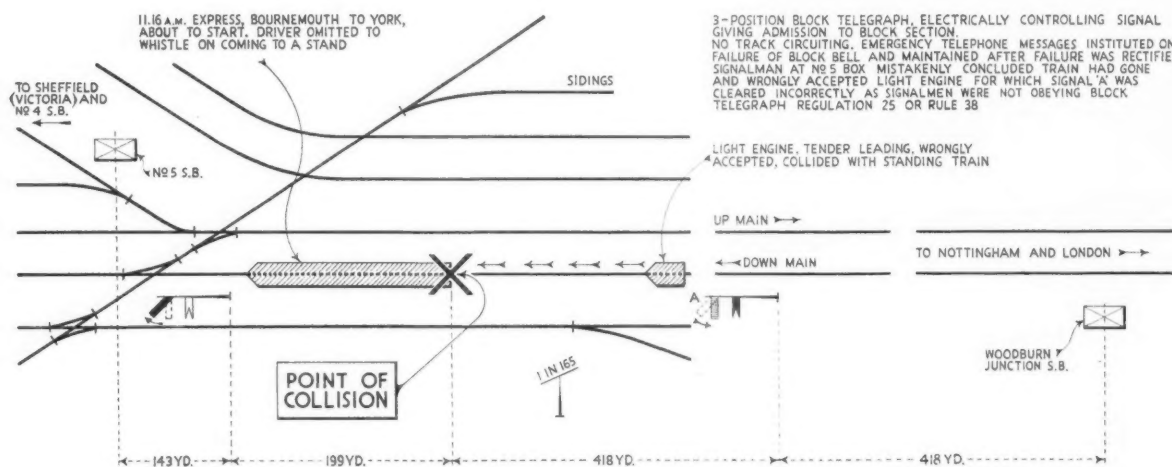


Diagram showing circumstances of accident at Sheffield, British Railways, Eastern Region, on January 25, 1954

aid on the spot or at the station, aided by a doctor travelling in the train. Calls for aid were not sent out until 6.25 but then it promptly arrived and was quickly given.

The rear three coaches were severely damaged. The two rear-most, built in 1951, withstood the shock well. The trailing end of the one ahead, a restaurant car built in 1927, was stove in. Both main lines were blocked but normal working was restored soon after midnight. In the meantime passenger trains were worked over the goods lines. It was dark but clear and very cold. The accompanying diagram shows the lines, signals, etc., essential to an understanding of the case

Course of Events and Evidence

At about 5.15 the block bell signals from Woodburn Junction were not being received correctly in No. 5 box and the two signalmen agreed to treat the bells in both boxes as having failed and to work under Block Telegraph Regulation 25 which, among other things, required them to:

- (i) exchange "line clear" messages on the telephone and operate their instruments accordingly;
- (ii) stop all trains in both directions, warn drivers and guards of the situation, and instruct them to proceed cautiously;

normal working because he thought to do so would delay traffic at a very busy time. Emergency working was still therefore in operation when Woodburn Junction asked "line clear" for the Bournemouth train, running about 3 min. late. Owing to the short intervals between trains it was checked but not stopped at all signals there and came to a stand at No. 5 box home signal at 6.1. On approaching there the driver whistled but not after stopping, as Rule 55, requires, although he knew he should do so.

This rule prescribes that in clear weather a train must not stand for more than 2 min. before the fireman proceeds to the signalbox. According to the driver he was told to go after that interval but had proceeded only a short distance when the signal was cleared and the driver called him back and released the brakes. The collision occurred and drove the engine forward about 10 yd.

The guard, who said the tail lamp was alight, thought they had been standing 3 to 4 min. by that time.

The train had been offered forward from No. 5 box when "entering section" was received but was refused by the box in advance, No. 4. At 6.4 the man at Woodburn Junction, speaking about another matter on the telephone, inquired where it was. The man in No. 5 box

After accepting the engine the man at No. 5 box offered it to No. 4, where the man went straight to the telephone and asked about the Bournemouth train, which he had not yet accepted. Realising that he had made a serious mistake, the man at No. 5 box asked that the train be accepted, which was done almost at once, to enable him to clear his home signal, in the hope that the train would start before the light engine reached it; Woodburn Junction told him it had left there.

The driver and fireman of the engine were keeping a careful lookout for the home signal, very difficult to see on account of the erection of steelwork for the forthcoming electrification. Neither saw the train's tail light. They estimated their speed on collision as 4 to 6 m.p.h., which was inconsistent with damage done.

No. 5 box was informed of the collision by telephone from the sidings at about 6.10 and the signalman sent "obstruction danger." Control was informed at about the same time but not until about 6.20 were they told by a yard inspector from No. 5 box that there were casualties. Calls for assistance went out at 6.25.

Inspecting Officer's Conclusions

The primary cause of the accident was giving "train out of section" while the train was at the home signal and the

block instrument indicated the correct state of affairs. The signalman had no excuse to offer for assuming it had gone and he had forgotten about that. He had only to look out of the box to see its lights.

Work was heavy at the time and Colonel McMullen thinks the man had allowed the block bell failure to upset him, but that should not have been so, for he was an experienced man of 63 and had been signalman for 30 years with a clear record.

Rules Disregarded

Both signalmen disregarded Rule 38 and parts of Block Regulation 25, for which there was no excuse. Had the light engine driver been warned to proceed cautiously the accident might have been avoided, or had the signalman at No. 5 box re-introduced normal working when the bells were found in order he might have recovered his composure and not forgotten the presence of the train.

Rule 55 required its driver to whistle when stopped at the home signal. Had he done so the signalman might have remembered it. Colonel McMullen thinks his judgment to have been faulty and that it must have been 3 to 4 min. before he told the fireman to go to the box. It is possible, however, that had he started within 2 min. he would not have arrived in time to prevent the accident.

The light engine driver cannot be criticised for failing to see the tail lamp ahead. He was running tender leading and, with his fireman, looking for a signal very difficult to see. This was re-positioned shortly after the accident.

Remarks

This accident could have been prevented had any one of three experienced railwaymen done what he knew was required of him. It was the direct result of the failure of a signalman who, under some stress, ignored the clear information given by his block instruments and assumed that he had himself forgotten to operate them correctly.

Controls of a type which will prevent this type of failure are being installed as rapidly as circumstance permit throughout the main lines of British Railways. This is in process here, in connection with electrification. There are, however, many signal boxes on important lines where this may take some time and safety must continue to depend on the signalmen's integrity.

In this case apparently they were attaching more importance to avoiding delay than to safety, but Colonel McMullen is satisfied that it is continually impressed on signalmen generally that whenever there is any doubt in the matter safety must come first.

It is to be regretted that there was delay in calling assistance. The calls were, however, promptly answered. With an accident at a distance from a box or railway centre it may be some time before assistance can be summoned, but that is not to be expected at a busy station such as Sheffield.

Not many there are trained in first aid, as at other comparable stations, and there were none in the nearby sidings on this occasion. Steps were already being taken to remedy this and the stationmaster was attending a class. It is hoped that the need for immediate rendering of first aid to any injured public or fellow workers will be recognised in the area and that more volunteers will be forthcoming for training in the future.

Benguela Railway Company

The annual report of the Benguela Railway Company for the year 1953 shows a decrease in receipts compared with 1952 of escudos 145,401 \$14, the total receipts being esc. 320,824,761 \$12 compared with esc. 320,970,162 \$26 in the preceding year. The decrease is wholly attributable to goods traffic, which fell by esc. 3,332,609 \$34. Passenger and sundries receipts rose by esc. 9,130 \$55 and 3,178,077 \$65 respectively. Working expenses increased by esc. 47,848,884 \$19 and totalled esc. 227,006,425 \$97. The figure for km. worked remained at 1,348, but total receipts per km. fell from esc. 238,108 \$43 to esc. 238,000 \$56. Net receipts per km. dropped from esc. 105,202 \$24 to esc. 69,598 \$17, while expenditure per km. rose from esc. 132,906 \$19 to esc. 168,702 \$39. The figure for km. run rose from 4,064,705 to 4,721,211, but revenue per train-km. dropped from esc. 78 \$97 to esc. 67 \$95. Expenditure per train-km. rose from esc. 44 \$08 to esc. 48 \$08. The working coefficient was 0.708 for 1953, compared with 0.558 in 1952.

Of the working expenses, esc. 206,881,425 \$97 was ordinary expenditure, and esc. 20,125,000 \$80 represented a transfer to the renewals fund. This fund, which started the year at esc. 103,737,302 \$85, was charged with work amounting to esc. 15,066,542 \$13 in 1953. From this figure realisations of capital assets amounting to esc. 1,388,846 \$87 were deducted, leaving esc. 13,677,695 \$26 to be deducted from the fund, which thus closed the year at esc. 110,184,607 \$59.

During the year 1953 the company invested some esc. 74,000,000 \$00 in buildings and new equipment. At the end of the year capital commitments amounted to some esc. 130,000,000 \$00. The number of eucalyptus trees planted to build up forest blocks for locomotive fuel supplies rose to about 76,000,000.

Rail-Served Airport in Belgium

Air passengers arriving at Melsbroek Airport in Belgium will, in a few years time, be able to reach the heart of Brussels in 10 minutes by electric train. The rail link should be in full operation by 1958, the year of the Brussels World Exhibition. A new station is to be built on the east side of the airfield from which trains will leave every 15 min. for Brussels.

Double track will run from the new station for one-and-a-half miles to the south-west before reaching the Brussels-Louvain main line at Zaventhem. It will run under the main line through a specially-built tunnel, and on to the existing branch line running through Dieghem, Haron-South, and Schaerbeek to the Brussels-Nord terminus where the track goes below ground to the underground platforms of the Gare Centrale, which the train enters on Track No. 2. At the Gare Centrale the service will have its own special track No. 7 which is a bay between Tracks No. 1 and 2. This will prevent the airport train from holding up traffic running underground from the Bruxelles-Nord Terminus through the Gare Centrale to the Bruxelles-Midi Terminus, as it will arrive on Track No. 2 and pass to Track No. 7, returning to Melsbroek on Track No. 1.

Part of the air terminal has been built over the Central Station and the airport service platform at the northern end of the station is connected by a shaft leading from the platform to the arrival and departure

halls inside the air terminal by means of stairs, lifts, and escalators.

This is the final plan, but meanwhile temporary measures are being taken in order to inaugurate the rail link as soon as possible—probably by the end of 1954—and cut out the present bus service. Diesel trains will be used, scheduled to run every half hour and to cover the distance in 17 minutes.

Temporary Level Crossing

From the provisional station now being built at the airport a single track will run to Zaventhem. Before a double track can be laid, this 1½-mile section built by the Germans 12 years ago, will have to be overhauled. At Zaventhem, until the tunnel is built, a level crossing will carry the track over the Brussels-Louvain main line on to the branch line to Brussels.

To lay the double track from the Airport to Zaventhem, and to build the station at the airport and the tunnel at Zaventhem, is estimated to cost some B.frs. 12,000,000-15,000,000. The line will not only be open to passengers arriving by airlines, but also to ordinary members of the public wishing to visit Melsbroek Airport. A further attraction is that passengers will have only to go down the escalators from the air terminus to the Gare Centrale to reach rail connections with every part of Belgium and the Continent.

A Plan for the Long Island Railroad

The Long Island Transit Authority, which has been operating the Long Island Rail Road in its present bankrupt condition, has formulated a plan to take the line out of receivership. This has the approval of the Pennsylvania Railroad, which owns the Long Island system, and has sunk over \$100 million in the property, on which it has received no return for some years. Without Pennsylvania agreement, therefore, any reorganisation scheme would be valueless. The Long Island R.R. owns a network of lines with a total route mileage of 376, and is physically connected with the Pennsylvania station in New York by tunnels under the East River.

The plan is based on the agreement of the Interstate Commerce Commission to a fare increase averaging 20 per cent, and to substantial tax relief during a twelve-year redevelopment period. For nine years the Long Island would be exempt from all state and local taxes except real estate taxes, and this arrangement would reduce the annual tax payments by the Long Island to about \$1,800,000. During the redevelopment period, the Long Island would have the right to charge fares sufficient to meet operating expenses, but not to provide any interest for the Pennsylvania on its previous investment in the company. All profit thus would be devoted to improving the facilities provided by the Long Island.

The first and most important task is that of improving the rolling stock. A total of 184 new passenger cars is to be purchased, at a cost of over \$24,000,000; of these 125 will be 120-seat cars for electric services, with air-conditioning, fluorescent lighting, and foam rubber seating; 57 are to be similar vehicles for non-electric services; and two will be Budd diesel-hydraulic cars for the Montauk branch. In addition, modernisation is to begin at once of 696 existing cars, at a cost of over \$21,000,000, most of this work being done in the Pennsylvania shops. The Pennsylvania

is prepared to make a loan of \$5,500,000 to enable this car rehabilitation programme to begin.

In addition, \$12,000,000 will be spent on modernising and improving both the system of distribution of electricity over the electrified part of the system and modernising and improving the shops, and on other improvements. The headquarters of the line will be established once again at Jamaica, under a new full-time General Manager, who will live on Long Island.

Last year the Long Island barely earned sufficient to pay state and local taxes, even at the reduced rate at which real estate taxes recently were compromised by the trustee. This year the costs of labour and power and the rent of wagons together have increased by \$2,400,000, and freight income has dropped by \$900,000, so that it is impossible for the railway to pay its way in present conditions. The generosity of the Pennsylvania management in agreeing to forgo any return on its Long Island investment for another nine years should be a powerful lever in securing public support of this comprehensive scheme.

Legislation to provide for the improvement of the Long Island, in accordance with these plans, has been approved by a special session of the New York State legislature, and signed by Governor Dewey. Mr. Thomas M. Goodfellow, Superintendent of the Pennsylvania's Pittsburgh Division, has been appointed General Manager, and will take up his duties as soon as the Long Island bankruptcy is terminated.

Parliamentary Notes

British Transport Commission Bill

The British Transport Commission Bill was read the third time with the amendments, and passed, in the House of Lords on July 27.

The amendments were considered by the House of Commons on July 28 and agreed to.

The Bill received the Royal Assent on July 30.

Crystal Palace-Nunhead Line

Mr. Henry Price (Lewisham West—C.), on the motion for the adjournment of the House of Commons on July 28, raised the question of the closing of the branch line from Crystal Palace High Level to Nunhead. Objections had been lodged, he said, to the proposals, and they were heard by the appropriate body, the Transport Users' Consultative Council for London, and turned down. They had been reviewed by the Central Consultative Council and had again been turned down. According to the B.T.C., a net annual saving of £65,000 would result from closing the line, the net annual receipts for which were £14,000. There had been no attempt since the war to make the line a commercial proposition. There appeared to have been a deliberate attempt on the part of those responsible to depress the value of this line, and to make it as unattractive as possible to the public.

He said that in London proposals for closing lines should be considered in relation to an overall policy, to popularise branch lines to relieve the load on road transport. The Transport Users' Consultative Committee could not consider that aspect of the matter because it was not advised of the capacity of the roads to take the additional traffic. Mr. Price then criticised the way in which the matter had been dealt with by the Committee and said that the inquiry was

not based on all the evidence available. If the Committee had been properly advised, it might well have come to another decision.

Mr. Hugh Molson (Joint Parliamentary Secretary to the Ministry of Transport and Civil Aviation) said that the Minister had no responsibility in this matter. The only circumstances in which the Minister was authorised to intervene in the day-to-day administration of the railways was if the Transport Users' Consultative Committee dissented from some action which had been taken by the B.T.C.

Mr. Price had suggested that London should be granted more favourable treatment than other parts of the country in the matter of closing down branch lines. Mr. Molson thought there would be a strong case for London to have less favourable treatment than other parts of the country. In the case of unremunerative lines in London where there were so many other forms of transport, it was London residents who had not used the lines while they were available who were to blame if they found that they were being closed down. It was the view of the Minister that one of the essential methods of efficient and up-to-date administration was to close down lines no longer remunerative. After closure of the branch, it was intended that additional trains should be run on the Catford Loop Line, where housing developments had led to the need for additional services at peak periods.

It had been estimated that in a representative week the maximum number of passengers recorded in any one train on any portion of the Crystal Palace-Nunhead branch was 152, whereas most four-coach trains had seats for 386.

Transport Charges Bill

The Earl of Selkirk (Paymaster General) moving the Second Reading of the Transport Charges etc. (Miscellaneous Provisions) Bill in the House of Lords on July 26, said its object was, on the one hand, to bring within a common system the machinery for the determination of fares in all forms of road transport—that was, buses, trams and trolleybuses, and, on the other hand, to bring independent railways under the same general system for determining charges which applied in the case of the British Transport Commission. The Bill would have the further advantage of dispensing with the need for employing Defence Regulations in regard to transport charges which had been extensively used by Ministers of Transport over the last 15 years.

The purpose of the Bill was to provide where possible, fair competition, and thereby to ensure the best service for the public in the varying circumstances of different localities.

Clause 3 of the Bill applied to independent railways and waterways. When a charges scheme was prepared by the British Transport Commission under the procedure laid down in the Transport Acts of 1947 and 1953, it was submitted to the Transport Tribunal, who would then hold a public enquiry before settling the terms of the scheme. When they had settled the charges, and the scheme had been approved, it could then be applied to independent railways and inland waterway undertakings. Clause 4 made it possible for the Minister to make such modifications or alterations to a charges scheme under Clause 3 as might be necessary in the application to the special circumstances of independent railways and inland waterway undertakings. Under Clause 5, independent railways were freed from the provisions relating to equality of charge and undue preference in exactly the same way as the British Transport Commission had been freed from such provisions

by the Transport Act, 1953. There also, he added, the independent railways were freed from those provisions under the same safeguards as had been incorporated in the Act of 1953 in respect of the British Transport Commission.

Lord Lucas of Chilworth said the Opposition would support the Bill and give it the Second Reading. The Bill did not go far enough, and he would put down amendments for consideration at the Committee stage.

The motion for the Second Reading was agreed to, and the Bill was committed to a Committee of the whole House.

Lincoln Level Crossings

During the discussion on the motion for the Second Reading of the Consolidated Fund Bill in the House of Commons on July 28, Mr. Geoffrey de Freitas (Lincoln—Lab.) said that when the railways came to Lincoln they laid their tracks right across the High Street. Lincoln was divided into halves joined by two streets, but the High Street was the principal one and it was cut and cut again by the railway. The gates of the principal level crossing were closed for 3 hr. 18 min. in the 12 hr. between 7.15 a.m. and 7.15 p.m. That was the highest figure, two years old, and was today nearer 4 hr. a day.

Mr. Hugh Molson (Joint Parliamentary Secretary to the Ministry of Transport & Civil Aviation) said he was sorry the problem had been outstanding so long. Lincoln was unfortunate in that it had three level crossings in the High Street and one was in Pelham Street. A scheme put forward by the City Council some years ago dealt with the level crossing in Pelham Street, and provided for a bridge. At the beginning of last July the Government agreed to the appointment of consulting engineers. He could not say then when the work could be begun, but the Ministry recognised its great urgency.

Questions in Parliament

Canal Survey Board

Mr. W. N. Warbey (Broxton—Lab.) asked the Minister of Transport & Civil Aviation the name and qualifications of the independent member appointed to the B.T.C. Canal Survey Board.

Mr. Hugh Molson (Joint Parliamentary Secretary) replied: The two independent members of the Board of Survey are Sir Rex Hodges, formerly General Manager & Secretary of the Mersey Docks & Harbour Board, and Mr. R. D. Brown, a civil engineer experienced in the design, construction, and operation of canals in this country and abroad.

Channel Tunnel

Mr. E. L. Mallalieu (Brigg—Lab.) on July 21 inquired if the Minister of Transport & Civil Aviation, in view of the desirability of demonstrating the solidarity of the peoples of France and Great Britain in peace and in war, would withdraw the objections which successive British Governments had raised to the construction of a tunnel under the Channel.

Mr. Alan Lennox-Boyd replied: While there are so many useful and necessary transport projects in this country which have more pressing claims on the limited resources available, I am afraid the Channel Tunnel will have to wait. Replying to a further question, he said that the development of air travel had strengthened the arguments against a tunnel which had by themselves prevailed with every Government for the last 50 years.

Contracts & Tenders

Charles Roberts & Co. Ltd. has received an order for 46 cistern tank wagons from the Ministry of Supply, on behalf of the War Department.

The Hunslet Engine Co. Ltd. has received from John Summers Limited an order for two 32-ton 204 b.h.p. diesel-mechanical shunting locomotives for Shotton steelworks. These are to have Gardner engines and Hunslet transmission.

The Occidental Railways of Cuba have placed orders with Anciens Etablissements Brissonneau & Lotz S.A., for six 750-h.p. diesel-electric Bo-Bo locomotives with Sulzer engines and Brissonneau & Lotz patent electric transmission. The locomotives are to be delivered in Havana by November of this year.

The Société Gregg d'Europe S.A., Lot-lez-Bruxelles, Belgium, has recently received orders for rolling stock for the railways of Colombia and Mozambique. Orders from Colombia are for 33 flat wagons, 90 gondola cars, 26 tank wagons, 85 box wagons, and 30 cattle wagons. Orders from Mozambique are for 20 baggage vans.

British Railways, North Eastern Region, have placed the following orders:—

Dorman, Long & Co. Ltd., Bridge Department, Luton: strengthening under main lines (Arches 1 to 4 and part No. 5). Additional work, Manors, Ouseburn Viaduct, Bridge No. 22.

Matisa Equipment Limited, London, S.W.1: provision of weather protection equipment, Matisa Tamping Machines.

A. R. Farrar & Company, Bradford: electrical installation, Forster Square Station, Bradford.

The Director General for Supplies & Disposals, New Delhi, invites tenders as follows:—

(a) 600 rings, piston, packing Britnip type with garter springs complete (bored to 2½ in.) for B-M-MT and BG class locomotives

(b) 440 copper joint rings Hulburd's patent round 27½ in. outside dia. for dome covers of locomotives, Hulhords section "6" H. & G. section "E"

(c) 7 crossheads, R.H. (partly finished sizes cast steel, suitable for B-I/NG type of engines to C.M.E. Central Railway Drawing No. MN(SP)336 alt. nil (DGS & D No. 9731) and IRS specification No. M2/48 class "A" group I

(d) 7 crossheads, L.H. (partly finished sizes cast steel, suitable for B-I/NG type of engines, to C.M.E. Central Railway Drawing No. MN(SP)337, alt. nil (DGS & D No. 9732) and IRS specification No. M2/48 class "A" grade I

Tenders, quoting the following references, will be received up to 10 a.m. on (a), (b) September 3; (c) (d) August 20. (a), (b) SRI/16581-2-E/IV; (c), (d) SRI/16522-E/II. Forms of tender for (a) and (b) are only available for purchase in India from the Deputy Director General (Supplies), Directorate General of Supplies & Disposals, New Delhi; Director of Supplies & Disposals, Bombay or Calcutta; Deputy Director of Supplies & Disposals, Madras.

Forms of tender for (c) and (d) are only available for purchase in India from the Deputy Director General (Supplies), Directorate General of Supplies & Disposals, New Delhi; Director of Supplies & Disposals, Madras.

If the date for the receipt of tenders does not allow sufficient time for tenderers

to obtain tender forms from India, they may submit their quotation to India in their own letter form or by telegram so long as all essential particulars are given and provided they simultaneously apply for the tender forms and return them duly completed as quickly as possible on the basis of advance quotations already submitted.

A copy of the tender form for (c) and (d) can be examined at the India Store Department, 32-44, Edgware Road, London, W.2, on application to the "CDN" Branch and the drawings can be seen at the Offices of Hodges, Bennett & Company, 59-60, Petty France, London S.W.1, from whom copies may be obtained at a fixed price per sheet.

According to the Special Register Information Service, Export Services Branch, Board of Trade, the Director General of Supplies and Disposals, Shah-jahan Road, New Delhi, is calling for tenders (Tender No. P/SW-2/18624-E/II) for the supply of 118 10mm. Simplex reversible type injectors, complete with minor assembly, to particular specification and drawings.

The closing date for the receipt of tenders is August 31. A set of the tender documents is available for loan to United Kingdom firms on application to the Export Services Branch, Lacon House, Theobalds Road, London, W.C.1.

Local representation is essential. It would be appreciated if firms proposing to tender would advise the Branch, and, at the same time, include the name of their overseas agent through whom they are submitting quotations in order that the United Kingdom Trade Commissioner at Delhi might be informed.

The Special Register Information Service, Export Services Branch, Board of Trade, states that it has received from the British Embassy, Cairo, information that the declaration on the application form for admission to the register of approved manufacturers for rolling stock, and so on, for the Egyptian Republican Railways, is to be modified. The declaration previously read as follows:—

"We, the undersigned, hereby undertake to bear all the expenses that the Administration may on the strength of this application, have gone to, in conducting such procedures as may be deemed necessary to effect the proper inspection of Works shown above and any other premises belonging thereto and will defray same in full and without any contestation on the Administration's first demand."

The declaration is to be re-worded to exclude the words "all expenses" and to make it clear that only a nominal inspection fee should be charged.

The latest date for the submission of applications from firms who wish to be included on the list of approved suppliers is January 1, 1955.

The Special Register Information Service, Export Services Branch, Board of Trade, reports that the Ministerio de Transportes de la Nacion, Ferrocarril D. F. Sarmiento, Argentina, is calling for tenders (Tender No. M54/100), for the supply of points and crossings for the Domingo F. Sarmiento Railway.

The closing date for the receipt of tenders is August 24, 1954. A copy of the tender documents (in Spanish) including specifications and conditions of contract, may be had on loan from the Branch (Lacon House, Theobalds Road, W.C.1). Local representation is essential.

Notes and News

Manufacture Under Licence of Diesel Engines.—A continental firm with overseas contracts completed and in hand desires to know of a British firm interested in the manufacture under licence of its engines. See Official Notices on page 196.

Vacancies for Temporary Technical Assistants.—Applications are invited for the posts of temporary technical assistants required in the office of the Assistant Civil Engineer (permanent way), London Transport. See Official Notices on page 196.

Locomotive Draughtsman and Senior Technical Assistant Required.—Applications are invited for the posts of locomotive draughtsman and senior technical assistant required for Chief Mechanical Engineer's Department of a British railway operating in Bolivia. See Official Notices on page 196.

Vacancies in the Transport & Harbour Department, British Guiana.—Vacancies exist in the Transport & Harbour Department, British Guiana, for a civil engineer, port engineer and mechanical engineer. Candidates for all three posts should be between 28 and 45 years of age. See Official Notices on page 196.

Staveley Coal & Iron Co. Ltd. Acquisition.—The Board of the Staveley Coal & Iron Co. Ltd. has announced that arrangements have now been completed for the acquisition of the whole of the issued share capital of W. H. Smith & Company (Electrical Engineers), of Manchester. The company will continue under the direction and management of the previous owners.

English Electric Co. Ltd. Interim Dividend.—The directors of English Electric Co. Ltd. have announced an interim ordinary dividend in respect of the year ending December 25, 1954, of 4 per cent, payable on September 15, on the capital raised to £10,616,193 by an issue of shares for cash and an issue of fully paid shares. An interim of 5 per cent was paid on account of the previous year on capital of £5,308,097.

Road Haulage Disposals in Scotland.—The Road Haulage Disposal Board and the British Transport Commission have issued a booklet which describes arrangements for the sale of most of the remaining lorries available for disposal in Scotland under the Transport Act, 1953. Copies of the booklet are available free of charge on application to the Commission or the Board, or to the Scottish Divisional Manager of British Road Services. The booklet is being issued now so as to give prospective purchasers the longest possible notice of the arrangements. It gives a general picture of the contents of a special Scottish list of units to be offered for public tender at the end of September.

Storm Affects Train Services.—A violent thunderstorm in London on the evening of August 6 caused flooding in the railway tunnels at the approach to Kings Cross station, Eastern Region. Trains were delayed between 8 p.m. and 10 p.m., when normal working was resumed. The up "Queen of Scots" had to be terminated at Finsbury Park. Flooding at Clapton caused two local trains on the Cambridge line to be diverted through Stratford, and passengers between Bethnal Green, Hackney Downs, Clapton, and Lea Bridge, were carried by bus until the water subsided. The

rain also affected signalling on London Transport lines and delays were caused to trains between Gloucester Road and Edgware Road.

Langho Goods Depot to be Closed.—The London Midland Region of British Railways announce that Langho goods depot, between Blackburn and Clitheroe, will be closed for all traffic on and from September 6. Alternative arrangements have been made for dealing with freight traffic.

Resumption of Traffic between Yugoslavia and Roumania.—An agreement on the resumption of railway traffic between Yugoslavia and Roumania is reported to have been signed at Belgrade on August 4. Through services were suspended some time after the defection of Yugoslavia from the "Iron Curtain" bloc of countries.

Emu Bay Railway Co. Ltd.—At the ordinary general meeting of the Emu Bay Railway Co. Ltd., in Melbourne on May 18, Sir Alexander Stewart, Chairman, said that gross revenue again showed a substantial improvement in the last financial year, being almost £50,000 greater than last year, reflecting increased freight rates as from June 11, 1953 and increased traffic, particularly minerals. Operating and maintenance expenses increased by £34,000. Much of the maintenance which had to be deferred because of the war and the consequent shortage of labour and materials, has now been made up. Replacement of some passenger railcars was necessary to handle satisfactorily the increased passenger traffic. A new diesel-hydraulic locomotive ordered from the North British Locomotive Co. Ltd., is powered by a Paxman diesel engine, and has Voith-North British Turbo transmission, was delivered during the year. It sustained extensive sea-water damage in transit, but after full overhaul was now in service. Continuous haulage under exacting working conditions had confirmed the view that this would considerably reduce haulage and maintenance costs. The company's financial position had prevented purchase

of the locomotive outright, but it had been acquired under satisfactory hire-purchase terms. An Australian Standard Garratt Locomotive had been purchased from the Commonwealth Government.

Hull Railway & Docks Clubs Sports.—The first sports meeting of the Hull Railway & Docks Club & Institute Branch of the British Railways Staff Association was held on the Ella Street Ground on July 24. Those present included Sir John Benstead, Deputy Chairman, British Transport Commission; Messrs. H. A. Short, Chief Regional Manager, and C. Cooper, Regional Staff Officer, North Eastern Region, British Railways; S. A. Finnis, Chief Docks Manager, Humber Ports; and W. G. Thorpe, District Operating Superintendent, Hull. Lady Benstead opened the sports.

Thomas De La Rue & Co. Ltd. Meeting.—At the annual meeting of Thomas De La Rue & Co. Ltd., on July 28, the Chairman, Mr. Bernard Clement Westall, said that the financial position of the company had improved considerably compared with the previous year. The main reason for improvement in the profit and loss account was the marked increase in the sales of Formica and Traffolyte. This expansion was largely in the home market. The use of Formica was increasingly being extended to canteens, transport services, and so on. He considered that further improvements could be expected. The report and accounts were adopted. An ordinary dividend of 20 per cent was approved.

George Spencer Moulton & Co. Ltd. Results.—Group current assets of George Spencer Moulton & Co. Ltd. for the year ended December 31, 1953, were £449,586, compared with £542,738 for the previous year. This included stocks £219,129 (£314,747), debtors £179,565 (£195,885), and cash £49,162 (£30,106). Current liabilities were £227,382 (£268,737), including bank overdrafts £9,143 (£4,946). Loans represented £125,500 (£136,500). The Chair-

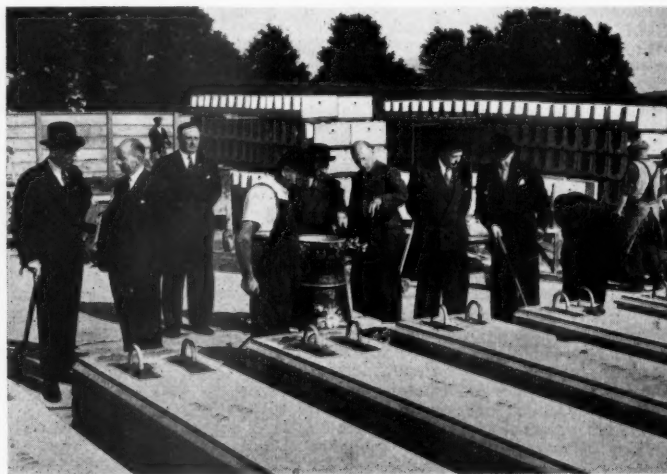
man, Mr. J. C. Spencer, has stated that although the order book position is satisfactory, trading conditions continue to be difficult and highly competitive. Results for the current year, he said, are not likely to be as satisfactory as the board would wish.

Modernisation of Mossbank West Station.—British Railways, Scottish Region, have rebuilt Mossbank West Station with up-to-date booking office facilities, waiting room accommodation, electric lighting, and central heating. The new buildings present a bright and pleasing appearance. The station, situated on the Glasgow St. Enoch-Paisley Canal line, deals with a heavy suburban traffic.

Disposal of Road Haulage Units.—Interim results of the offer of 1,334 vehicles in 505 units without premises which were contained in List No. 6 have been announced by the British Transport Commission and the Road Haulage Disposal Board. With 51 units still undecided at July 27, tenders had been accepted for 76 per cent of the units and 70 per cent of vehicles offered in units other than contract hire units. Of general units, the highest tenders have been accepted for 363 units (855 vehicles), all tenders have been rejected for 47 units (164 vehicles), no bids were received for 15 units (54 vehicles) and 48 cases (143 vehicles) were undecided. The respective figures for contract hire units were 21 (31 vehicles), 4 (28 vehicles), 4 (17 vehicles), and 3 (42 vehicles).

Salvador Railway Co. Ltd. Results.—Gross receipts of the Salvador Railway Co. Ltd. for the year ended June 30, 1953, were £188,026, compared with £171,205 for the previous year. After deduction of expenses there was an operating profit of £5,612 (loss £8,862). The credit balance carried forward was £5,784 (£21,689 debit). In his statement circulated with the accounts, Mr. R. W. Adeane, the Chairman, states that export traffic, largely of coffee, contributed 80 per cent more revenue as the coffee crop was very good and higher rates

Sir Brian Robertson in the West of England



(Left) Arrival at Plymouth North Road, with officers of the Western Region, showing (left to right) Messrs. Gilbert Matthews, H. H. Phillips, M. G. R. Smith, Sir Brian Robertson, and Mr. F. G. Dean, District Traffic Superintendent, Plymouth. (Right) At Taunton Concrete Depot with (second from left) Mr. H. L. Douglas, District Engineer, and Mr. C. J. Rider (see our July 30 issue)

were approved by the emergency Transport Tribunal late in 1952. Passenger traffic declined in volume and value during the year. There is fierce road competition and if conditions remain as they are the company may find it difficult to pay its way.

Cook's New Branch in Canada.—A new Canadian office at Edmonton, Alberta, has been opened by Thos. Cook & Son (Continental & Overseas) Limited, with Mr. R. R. Goss as manager. Cook's now have six branches in Canada.

New Cafeteria at Stoke-on-Trent.—A new cafeteria and licensed bar has been opened at Stoke-on-Trent Station, London Midland Region, in place of the two adjacent refreshment rooms on No. 1 platform. The dividing wall between the two rooms has been removed. Improvements include a terrazzo floor, a counter top in opaline green Formica with front, and screens in Australian walnut Waverite. At the same time the kitchen, cellar, and store facilities have been modernised and a staff dining room and managers' office provided. The work has been carried out by the London Midland Region District Engineer and William Mason & Son, of Leeds.

General Electric Co. Ltd. Results.—The consolidated profit and loss account of the General Electric Co. Ltd. and subsidiary companies shows a gross trading profit of £8,264,047 for the year ended March 31 last. This compares with £6,519,615 in the previous year. To this is added £192,145 (£189,691) representing income from investments. After deduction of £1,300,055 (£1,151,517) for depreciation, and further amounts for remuneration of directors, contributions to pension fund, provisions for unascertained liabilities, and so on, there was an aggregate profit before taxation of £5,777,918 (£4,230,234). Taxation in the U.K. took £3,053,711 (£2,503,657) and overseas taxation £302,396 (£398,288). Profits attributable to minority shareholders in subsidiaries amounted to £57,466 (£62,235), leaving a consolidated net profit of £2,364,345 (£1,266,054). To this is added £3,595,942 (£2,821,638) brought forward from the previous year, and other items, making a total of £6,429,110 (£6,914,725) available for appropriation. Dividends and transfers to reserves take £2,289,488,

leaving £4,139,622 to be carried forward. A final ordinary dividend of 8½ per cent (7½ per cent) is proposed.

Plugs for Electric Razors.—The S.N.C.F. is installing plugs for electric razors in all long-distance passenger stock, including diesel railcar sets. All new coaches are having points built into the toilet compartments at the time of construction; similar facilities will be installed in existing stock when it is in shops for overhaul.

Railway & General Engineering Co. Ltd.—Freehold land and buildings stand in the accounts of the Railway & General Engineering Co. Ltd. for the year ended March 31, 1954, at £47,180, compared with £46,500 in the previous year. The directors state that an independent valuation disclosed a value of £133,000, thus making it unnecessary further to depreciate that item. Plant, patterns, and so on figure at £36,725 (£36,335). Current assets total £125,943 (£122,375), and current liabilities and provisions £68,691 (£57,675), including bank overdraft £36,107 (£6,098). Reserves and surplus amount to £40,887 (£47,535). The annual meeting will be held in Nottingham on August 25.

Success of a Venture.—Early in June the North Eastern Region of British Railways, having decided to run a touring excursion train from Newcastle and Sunderland during the two main holiday weeks commencing July 26, asked the general public, through the medium of the Press, to enter a competition to name the train. The train was particularly suitable for stay-at-home holidaymakers in the Newcastle and Sunderland areas who wished to go out for the day, return home the same night, and occupy the same seat each day. No less than 345 separate names were submitted in 235 individual entries. The name chosen from those submitted was "Northern Venturer," suggested by two people, both of whom were given a prize in the form of tickets for the train. A ticket for the first week to the four destinations of Morecambe, Harrogate, Edinburgh, and Scarborough cost, 57s. 6d. for the second week to Scarborough, Edinburgh, and Morecambe the charge was 50s. Saloon type coaches were used with buffet

N.E. Region Holiday Poster



New poster produced by the Department of the Public Relations & Publicity Officer, North Eastern Region

or cafeteria car. All seats were numbered and used only by their individual owners. Mileage of the train on its first week was 842 (standard fare 122s. 9d.); on the second week 692 miles were covered. For the first week 283 passengers were booked, and for the second 442.

Runaway Engine Chasers Commended.—At a presentation at Woking recently, Mr. P. C. Thorne, stationmaster, and Mr. J. Hughes, a porter, of Wokingham Station, British Railways, Southern Region, were handed cheques in recognition of their services in stopping a runaway locomotive. On the night of May 25 an unattended engine at Reading began to move and ran away under steam towards Wokingham. Mr. Thorne chased the engine in his motorcar to a point where a rising gradient caused a reduction in speed and then, assisted by Mr. Hughes, climbed on to the footplate of the engine, which was then travelling at some 5 m.p.h., and brought it to a halt. The presentation was made by Mr. P. A. White, District Traffic Superintendent.

Motor Rail Limited Assets.—The current assets of Motor Rail Limited appear in the balance sheet for the year ended March 20 last at £286,176, compared with £269,682 for the previous year. Stocks stood at £162,416 (£166,190), work in progress at £39,983 (£38,177), tax certificates at £5,000 (nil), and cash £29,898 (£6,171). Current liabilities were £28,915 (£33,546), capital reserves £68,880 (£67,255) and revenue reserve and surplus £91,648 (£69,586). Mr. J. D. Abbott, the Chairman, says that output for the first three months of the current year has exceeded that in the corresponding period of last year, and the margin of profit can be considered reasonable. The order book, he says, has, however, shortened materially. Financial results were given briefly in our issue of July 2.



New cafeteria and licensed bar at Stoke-on-Trent, showing use of plastic materials in counter

Railway Stock Market

The big rise in Anglo-Iranian oil shares following the Persian settlement terms has been the outstanding feature in the continued strength and activity of stock markets. Some observers profess to see a change of emphasis, namely a switch of buying interest away from gilt-edged stocks and industrial shares to gold and commodity shares. It is true that Kaffir gold shares have been rather more active this week, and rubber shares improved, but there has been no outstanding demand. It is too early yet to say whether this trend will be developed. In view of the big rise in British Funds and industrial shares it is not surprising that buying interest is tending to broaden in other directions where current yields and possible scope for appreciation in the future may be greater. Many leading industrial shares are now at prices showing yields of only 4 per cent even assuming best anticipations in respect of the next dividends are borne out. If there is a broadening of interest in other sections of markets, it may be that foreign railway and kindred stocks will also receive more attention.

In fact, they have been more active this week and showed a number of features. Outstanding has been a big advance in White Pass no par value shares, which have advanced to \$33½ at the time of writing, compared with only \$25 a week ago, the long term development plans for the Yukon having drawn attention to the scope for the railway and the possibilities of its shares and stocks. The 5 per cent convertible debentures have been prominent, up to £113, an advance of £15, compared with a week ago, while the 5½ per cent stock was also higher on balance at £33½. These spectacular movements illustrate that railway stocks, most of which are at low levels because of the fact that they attract only moderate attention in markets, can rise sharply in price when, for one reason or another, buying develops over a week or so. White Pass shares are, from the investment point of view, essentially a holding for more than a short period, but as the recent movement has shown, they can offer scope for a good deal of movement and capital appreciation from time to time. This also applies to the 5 per cent debentures as well because of their rights of conversion into the shares.

Canadian Pacific were more active, but moved lower because they moved closely with the trend of New York markets which have shown a reactionary tendency at the time of writing. The price eased slightly to \$46½, but the 4 per cent preference stock and debentures have been firm at £68 and £91 respectively, yield considerations tending to bring in buyers.

After its good rise, Antofagasta preference stock came in for a little profit-taking, and at 43 failed to hold all the good rise. The ordinary stock changed hands around 8½. In other directions, Costa Rica 6½ per cent first debentures changed hands at 62 and the 6½ per cent second debentures at 47, but elsewhere, buying interest in Dorada ordinary stock waned and the price receded to 81. Business up to 8 was recorded in Brazil Railway bonds. There was activity in Guayaquil & Quito 5 per cent bonds up to 60½. Elsewhere, Chilean Northern 5 per cent first debentures transferred around 28½. Nitrate Rails shares were 20s. 3d. and Taltal shares were dealt in around 13s. 3d. Elsewhere activity up to 30½ developed in Wolmar 4½ per cent bonds. Mexican Central bearer debentures eased to 73. San Paulo ordinary

units were 4s. United of Havana stocks kept firm with the second income stock at 37 and consolidated stock 5½. Among Indian rails, Barsi have been firmer with business up to 107½. Midland of Western Australia changed hands around 21½ and Emu Bay 5 per cent debentures were 44½. Buyers have been about for Nyasaland Railways shares up to 5s. 6d.

Road transport shares were firm, as usual, with Southdown 32s., West Riding 31s. and Lancashire Transport 59s. 6d. B.E.T. 5s. "A" deferred units moved higher at 60s. 3d. Among engineering shares there were small irregular movements. Vickers eased to 34s. 6d., Babcock & Wilcox were 62s. 3d., Guest Keen 60s. 1½d., Ruston & Hornsby 55s. 9d. and T. W. Ward 50s. 3d. Tube Investments were good at 70s. The premium on Stewarts & Lloyds shares rose further to 3s., which compares with a discount of 7½d. when dealings started. This, the City thinks, provides a favourable background for the next issue of de-nationalised steel shares, which is looked for shortly. It is expected to be either Dorman Long, Whitehead Iron, or Colvilles.

Among shares of locomotive builders and engineers, Beyer Peacock rose to 41s. 9d. Birmingham Carriage were 27s., Hurst Nelson 42s. and North British Locomotive 16s. 6d. Vulcan Foundry were 27s., Gloucester Wagon 10s. shares 19s. 9d., Charles Roberts 5s. shares 8s. 10½d., and Wagon Repairs 5s. shares 13s. 1½d.

OFFICIAL NOTICES

The engagement of persons answering Situations Vacant advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is exempted from the provisions of the Notification of Vacancies Order, 1952.

SALES ENGINEER required for Company marketing diesel trains and trolley buses. Should have some technical training particularly with regard to diesel engines and transmissions. Commercial experience an asset, salary dependent upon experience. Box 295, *The Railway Gazette*, 33 Tothill Street, London, S.W.1.

TRAFFIC ASSISTANTS required for Central Railway of Peru and Guayaquil-La-Paz Railway (Bolivia). Qualifications required: previous training in Railway Traffic Department or Transportation Company. Active and of first class health. Age 25/35 years. Preferably single. Knowledge of Spanish most desirable or willingness to learn within six months. Future prospects for right man willing to take opportunities. Apply, Secretary, Peruvian Corporation Limited, 144, Leadenhall Street, London, E.C.3.

LOCOMOTIVE DRAUGHTSMAN and SENIOR TECHNICAL ASSISTANT required for Chief Mechanical Engineer's Department of British Railway operating in Bolivia. Candidates for these two posts, preferably A.M.I.Mech. E., B.Sc. (Eng.) or Higher National, must have had good experience in drawing office and workshops of Locomotive Builders or Railway. Preferably married, but where workshops located no suitable educational facilities for children. Knowledge of Spanish an advantage but not essential. Commensurate salary £850 p.a. plus quarters, passages, allowances, etc. Write Box 7890, c/o Charles Barker & Sons, Ltd., 31, Budge Row, London, E.C.4.

LONDON TRANSPORT require temporary technical assistants, office of the Assistant Civil Engineer (Permanent Way); knowledge of permanent way design, drawing office experience, grounding in civil engineering, knowledge of mathematics, ability to use theodolite and level and make land surveys. Students of Institution of Civil Engineers preferred but young graduates without experience considered. Salary £343 10s. at 21 rising to £613 10s. subject to satisfactory service, with additional payments for certain recognised qualifications; medical examination. Applications to Staff Officer (F/E.V. 281), London Transport, 55, Broadway, S.W.1. For acknowledgement enclose addressed envelope.

HER MAJESTY'S COLONIAL SERVICE. The following vacancies exist in the TRANSPORT AND HARBOURS DEPARTMENT, BRITISH GUANA.

(a) **CIVIL ENGINEER** (BCD 119/30/04/D15). Duties include the construction and layout of passenger and goods stations and other buildings on a small railway; remodelling of existing yards and sidings; rehabilitation of existing structures in brick or timber; construction of timber pile wharves. Some railway and wharf experience is essential, and experience of level crossings and signalling desirable.

(b) **PORT ENGINEER** (BCD 119/30/05/D15). Duties include the design, estimating, and construction and maintenance of warehouses, offices of timber wharves in tidal estuaries; of four terminals for through loading ferry boats on two tidal estuaries, and the enlargement and repair of a small dry dock. Candidates must be experienced in port and estuary work.

(c) **MECHANICAL ENGINEER** (BCD 119/30/06/D15). Duties include the erection, operation and maintenance of new locomotives, rolling-stock and cranes, the handling of machinery and responsibility for the workshops production, and maintenance of existing locomotives and rolling-stock. Candidates with workshop and running experience preferred; experience in steam and diesel engines desirable.

Candidates for all three posts should be between 28 and 45 years of age. For posts (a) and (b) they must hold a recognised University Degree or Diploma in Civil Engineering which carries exemption from, or have passed, Final Parts I and II of the A.M.I.C.E. examination plus at least two years approved practical experience. For post (c) they must hold a recognised University Degree or Diploma in Mechanical Engineering which carries exemption from Parts A and B of the A.M.I.Mech.E. examination, plus at least two years training in industrial mechanical engineering workshops. Appointments are on contract gratuity terms, for two years resident service, with possibility of short extension. Salaries, according to experience, in the range of £1,000-£1,500 per annum plus gratuity of 22½ per cent, of basic salary in respect of each completed period of three months satisfactory service, payable on satisfactory completion of contract. For full details, apply in writing to The Director of Recruitment, Colonial Office, Great Smith Street, London, S.W.1, giving brief details of age, qualifications and experience, and quoting relevant reference number.

CONTINENTAL firm of major standing with world wide contracts completed and in hand desires to know British firm interested in the manufacture under licence of their locomotive engines. These engines have been assessed as being equal to, and in certain features, in advance of the best U.K. and overseas types. The engine has also been fitted with the necessary attachments in the N.A.T.O. programme of minesweepers and in the latest type of fishing trawlers. Generous terms for licensees and fullest co-operation are offered to interested manufacturers. Box 318, *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

BOUND VOLUMES.—We can arrange for readers' copies to be bound in fur cloth at a charge of 25s. per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tothill Press, Limited, 33, Tothill Street, London, S.W.1.

Forthcoming Meetings

August 18 (Wed.) to August 28 (Sat.).—*"The Model Engineer"* Exhibition at the New Horticultural Hall, London, S.W.1.

September 3 (Fri.).—The Railway Club, at 57, Fetter Lane, London, E.C.4, at 7 p.m. Paper entitled *"The Bexley Heath Railway,"* by Mr. E. A. Course.

September 6 (Mon.). to September 14 (Tue.).—Institute of Metals; Forty-sixth Annual Autumn Meeting in Switzerland.

September 7 (Tue.).—Permanent Way Institution, Leeds & Bradford Section, at British Railways Social and Recreational Club, Ellis Court, Leeds City North Station, at 7 p.m. Paper on *"Permanent Way 'Mechanical Muscles' in use on British Railways,"* illustrated by lantern slides, by Mr. R. C. Mose-dale, Senior Technical Assistant to District Engineer, Leeds, N.E.R.

Until September 25 (Sat.).—*"Popular Carriage"* Exhibition (Two centuries of carriage design for road and rail) in the Shareholders' Meeting Room, Euston Station, London, N.W.1. Weekdays 10 a.m. to 7 p.m.; Sundays 2 to 7 p.m.